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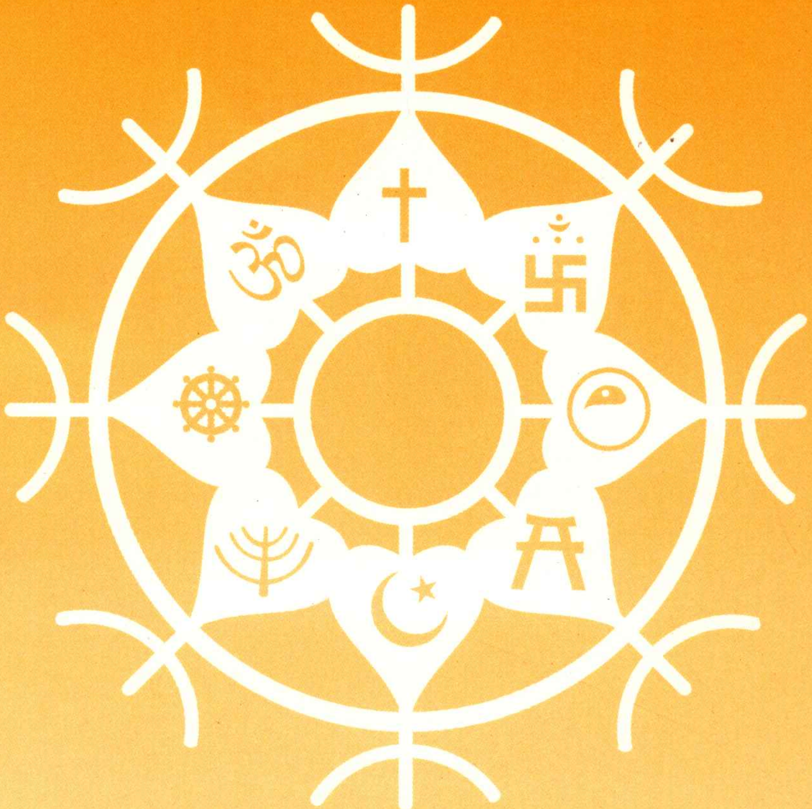

SCIENCE AND RELIGION

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Email: dharma@dvk.in

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HOLISTIC ACCOUNT OF REALITY

Necessity of an Integration of Science and Religion for the Better Future of Humanity

Mathew Chandrankunnel◆

1. Introduction

Science and religion were said to be in conflict exhuming the condemnation of Galileo and Chardin by religion and the rejection of God as a hypothesis by La Place. Science, however, became aware of its own limitations by encountering profound questions about the beginning, evolution and future of the universe, beginning, evolution and goal of life, and the inability to control diseases etc. Religion with its dogmatic arrogance in the past dictated a description of the universe which the sciences had shown to be wrong. Now the extremist view from the part of science as scientism and from the part of religion as dogmatism lost their arrogance and became aware of their own inherent limitations and stopped encroaching the other domain making category mistakes. Thus science and religion are coming all the more closer shedding the age old suspicion and looking forward to work together in resolving the acute problems humanity facing today. The ecological crisis, malnutrition, poverty, illiteracy, hunger and diseases can be contained if the scientific resources and the religious resources could work together. The Western culture is dominated by the rational science and technology which almost rejected the religious perspective while the Eastern culture overemphasized the spiritual rejecting matter as an illusion. A new civilization could be founded on an integrated outlook on science and religion that can facilitate life through the innumerable technological gadgets the technology can provide while religion can offer profound meaning to life enabling humanity to be the stewards of the universe. Such a golden opportunity is visible in the horizon through the integration of science and religion as the West is in a crisis due to the loss of its own religious roots and the East is impoverished because of its own failure to acknowledge the existence of matter.

◆**Dr. Mathew Chandrankunnel** is the Professor of Philosophy of Science at Dharmaram Vidya Kshetram, Bangalore and Director of Science and Technology, Laity Commission, Syro-Malabar Church. He received the CTNS-Templeton award for the integration of science and religion in 2000. He is also an Associate Editor of the *Journal of Dharma* and edited this issue of the Journal on "Science and Religion."

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Therefore, I summarily present the critique on science and religion given by a French scientist who became a Buddhist monk who examined the frames of references, the foundations of science and the necessity of complimenting science by incorporating the religious perspectives. Thereafter, I examine the observations of the various philosophers on our culture as fragmented and crisis ridden by science and technology and arrive at my own conclusions from the many years of serious reflections and pondering over the science and religion dialogue and propose a plausible interaction strategy and a factual future research programme.

2. Western Science Interacting Eastern Religion

The Monk and the Philosopher: A Father and Son Discuss the Meaning of Life is written by a father son duo, Jean Francois Revel and Matthieu Ricard and published by the Schocken Books, New York, 1999. It contains 351 pages of interactive conversations on science and religion and the authors' conflicting perspectives and discovery of drawbacks pertaining to the Western culture and civilization. An extended examination of the book is given since it analyses the foundations of the Western civilization and its lack of religious components which were eliminated gradually from the renaissance period due to the fragmentation of reason and faith and the total elimination and annihilation of all faith components from the realms of the society and the individual. Revel raised fundamental questions on Ricard's conversion from science to faith and his growth in religious life, while the son questioned the father's concepts on the French liberal life, his search for the deeper dimensions of meaning in life etc. The philosopher father raised questions and doubts on Buddhism and on the scientific validity of the Buddhist meditation practices. The son who was a scientist and later turned out to be a Buddhist religious monk answered that the Buddhist religious practice was a contemplative science. According to him, it was a science of the inner mental world that complemented the discoveries of the modern science that engineer the physical world. As we live in an era where religion and science are coming together to solve the problems facing humanity, these critical reflections offer more than a dialogue between a scientist and a philosopher. It shows an emerging trend that understanding the spiritual dimension is important or even more significant than the discoveries about the physical universe. As both father and the son are intellectuals, their questions and answers delve deep into the foundations of science and especially of the Western culture which is at present devoid of that faith and reclaims the importance of faith in human lives. Thus, this dialogue evolves as an encounter between the rational Christian West and the intuitive religious East.

In 1966, Ricard was at the *Institut Pasteur* doing his doctorate in molecular biology under Prof. Francois Jacob, the eminent Nobel Prize winner for biology. Just after the defence of his doctoral thesis, Ricard stunned his mentor Prof. Jacob and his father Revel by announcing that he was heading towards Kathmandu in order to become a Buddhist monk. Both of them could not understand the logic and Ricard explained to them his reasons. Then only they came to know that already several times he had been to Kathmandu with the Buddhist monks and liked their religious life. For Ricard, the encounter with the Buddhist monks started accidentally. He got a chance to see the editing works of a film made by his friend Arnaud Desjardins on the Buddhist lamas who fled the Chinese invasion in 1959. Arnaud filmed them at close quarters and those films were very striking. At that time, Ricard had six months of break and was about to go to Japan to practice martial arts. But the pictures of those sombre lamas always haunted him, and indeed, inspired him. These lamas touched him as embodiments of perfection and compassion. In them he saw matchless purity and deeply inspiring personality. As Ricard met many illustrious people in every walk of life at home brought by his famous father, he found that though these intellectuals and artists have possessed mastery in their fields, they lacked human qualities such as altruism, goodness, sincerity and love. The grace filled faces of those monks, for Ricard, seemed to reflect what they taught. So this experience made Ricard to go in search of them and to imbibe this spirit of sympathy and love into his own personality.

As he was continuing his research, Ricard had a feeling that he was not using the full potential of his human life and felt that day by day he was drifting away from life. "For me, the mass of scientific knowledge had become a major contribution to minor needs."[1] His own scientific activities thus became worthless and he mentally felt inclined towards the maroon rob and the practice of inner control than the external environment. Just after the doctoral defence, he flew back to Kathmandu and took *sannyasa* from Kangyur Rinpoche. Thus Kangyur Rinpoche became a focal point of Ricard's life. Under his training Ricard learned religious life, meditation practices and mental control. After twenty long years, he became an assistant to the Dalai Lama and accompanied him in his world tours. He wrote *Journey to Enlightenment* and a translated many Tibetan books into English and French. He lives at present at the Shechen Monastery in Nepal where part of the conversations took place.

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[1] Ricard, *Monk*, 16.

3. The Necessity of a Contemplative Science

According to Ricard who is now trained both in science and religious life, meditation is not just to sit calm and have a beatific mood. It has an analytic and contemplative approach to understand the nature and functioning of the mind, and to perceive the transitory nature of things. Post meditation practise consists of avoiding slipping back into our habits exactly before meditation. Meditation is an understanding of the nature of mind and it's functioning so that through it one becomes a better human being, having openness, goodness, patience and an inspiring life in its everydayness. It is to blossom the inner peace.

According to Ricard, spiritual life contains three complimentary aspects: vision, meditation and action. The vision is the philosophical perspective, an investigation of the ultimate nature of things of the phenomenal world and of the mind. Meditation is familiarising with this vision and integrating it through spiritual practice into the stream of consciousness in such a way that the personality identifies with the vision. Action is the expression in the outer world of the inner knowledge acquired through vision and meditation. It is a matter of applying and maintaining that knowledge in all circumstances. This is the phase in which morals and ethics enter into the personal life. This enlightenment enables one to undertake a particular action and avoid another and thereby give happiness to others while making progress in one's life in spirituality.

Spiritual life or contemplative life is a matter of transforming oneself, a science of the mind, and a search for truth. The spiritual search, when it brings true inner transformation, is an experience that is fully alive, an unceasingly renewed freshness. "We can end a conflict, or a war, but there will always be more, unless people's minds change. There is a way of discovering an inner peace that does not depend on health, power, success, money, or the pleasures of the senses, an inner peace that's the source of outer peace; an inner certainty that nothing and no one can ever take away from me."[2] Ricard was in search of that ultimate happiness which nobody can steal from him.

One of the practical techniques for meditation involves concentrating on the breathing. The inhale-exhale cycle helps a person to understand the functioning of the body system and gives a clue to the inner dynamics of the mind. There are also dance programmes that lead people to meditative moods and explain the dynamics of the mind. One of the austere techniques is wearing a wet cloth in winter season and drying it just by the body heat. As soon as the cloth is dried, another wet cloth is put on the body. This practice is done above 13,000ft and the temperature at winter season will be very low. Ricard practised it for five such winters continuously. Such severe actions help the practitioner to tame his body and through that his mind and understand the non-existence of ego and feel the momentariness of life. Rituals are correct actions, etymologically. They call for reflection, meditation and prayer. The recitations during the rituals are invitations to meditation and the music is to calm down a person than to excite him or her. It is not merely an artistic expression but an offering to arouse mindfulness. It is a group practice. The supernatural beings are symbolic expressions of qualities and not gods. They are skilful visualisations enabling the practitioner of meditation for sharper concentration. Instead of dispersing the mind, they concentrate on the mindfulness to stabilise the mind to evolve the primordial Buddha nature in you.

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[2] Ricard, *Monk*, 17.

Rituals are also techniques that enable one to eradicate the non-existent ego and to attain enlightenment. To prostrate before the deity and the master serves to annihilate one's pride and it is pride that prevents wisdom and compassion from emerging. "True merit does not accumulate on the peak of pride" thus goes a Tibetan phrase. When one touches the ground with five points; two hands, two knees and the forehead, one aspires to eliminate five poisons namely, hatred, desire, ignorance, pride and jealousy, by transforming them into five corresponding aspects of wisdom. As you gather yourself from the prostration you pray "I gather all the sufferings of all beings upon myself and rid them entirely of them all."[3]

Emotions like hatred, jealousy, dissatisfaction, desire etc., do not have the power that we wrongly attribute to them. When we examine them closely, in their nakedness, we see that they do not have the solidity and power to restrain a person that they seemed at first sight to possess. Such continuous examination and practice in perseverance will keep the mind in its natural state. As soon as negative thoughts arise, first one has to recognise it as spotting a person in the crowd. The second stage is like a snake untying its own knot, one can liberate oneself from these knots of the self. One needs no external help. Just like the knot in a horse's tail, it is undone just by itself. Thus by discovering the unreality of thoughts, one can liberate oneself from harmful thoughts; thoughts come and go without enslaving. The mind stays at a clear wakeful awareness.

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[3] Ricard, *Monk*, 260.

4. Search for the Science of the Mind

Ricard after delving deep into the Buddhist spirituality, critiques the West which is driven by science and technology, but devoid of religiosity and spirituality. He is of the opinion that the science of the mind has been neglected in favour of the science of the material world. He argues that objective science in the West has helped to alleviate physical miseries, diseases and natural calamities. By controlling the environmental factors, science has raised life expectancy, in terms of purely external progress. However, Ricard diagnoses that it got harmful consequences like intolerance and aggression. For him, the phenomenal world is the world of relative truth. The relative truth of the phenomenal world is the world of science, of cause and effect. The ultimate truth is emptiness or absolute truth that is non-dual and cannot be attained by any logical thought. The Western mind is in search of the relative truth connected with the phenomenal world at the expense of the Emptiness is not nothingness related to the eternal truth. It is an existence of all possibilities. Emptiness is not a negation. It is an absence of any true existence, it is not 'like an empty space within a container, but the very nature of the container and whatever it contains.'[4]

The analysis of history and the interpretation of time as past, present and future belongs to the phenomenal world. The emptiness, is an unchanging time, is beyond the phenomenal time. In Buddhist cosmology the cycle of the universe has three dimensions. There is a period in which it is formed, a period in which it remains present and a period in which it is destroyed, and a period in which nothing is manifested, that is emptiness. It is an all possibility, as a sutra explains, emptiness is form and form is emptiness – it is something like matter is energy and energy is matter.

Ricard goes on to explain that the phenomenal world is the result of our interactions with our consciousness; it is neither a projection of our mind nor totally independent of our minds. An inner realisation of the true nature of things is therefore necessary.[5] The contemplation of the absolute truth transcends the duality of thinking, cause and effect, subject object dichotomy and thus can discover that nothing exists in itself. Ricard also reveals that Buddhism does not claim any monopoly of the truth and it is not constructing any dogma either. But what it does truly is developing a science of the mind and techniques to alleviate suffering permanently and liberate all living beings. Unlike the science that transforms the environment, Buddhism tries to change the individual and to attain a realisation of the ultimate nature of things through the manipulation of the mind, namely, through contemplation. It also aims at transforming the society through reforming the individual. It is a philosophy of happiness accepting the reality of the unsatisfactoriness of the ordinary world. Buddhism, according to Ricard, is a movement from pessimism and apathy to intense mental activity and stillness of the mind before the pleasures and sufferings of the world. Buddha is a doctor, Buddhists are all those who are sick, and spiritual practices are the processes of getting cured. Buddhism is a manual for living properly and attaining death as a culmination of good life. Buddhist teachings are like travel guides that lead others along the same path that Buddha took for himself.

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[4] Ricard, *Monk*, 137.

[5] Ricard, *Monk*, 143.

Transformation of one's self starts by the elimination of the infatuated self or, as we find in psychological terms the ego. Thus, the field is cleared for goodness, humility and altruism. Ricard felt that Buddhist monks are endowed with peace, compassion, grace, goodness, altruism, sincerity and wisdom. They meticulously practice what they preach and possess deep inspiring perfection. But when we compare them with scientists, artists and poets, often we find them unhappy about themselves, full of self inflated pride, and lacking in perfection. Buddhism emphasizes that it's the mind that colours ones actions. Power and money do not bring happiness. Jealously and pride actually destroy all joy in life. It is our experience that small clouds do not bring rain. If an unbridled desire dominates, the power of constructive altruism, an inner freedom that is outwardly exhibited as inner certainty, will definitely vanish.

Ricard emphasises that science is West's success and it does not speak to each one of our hearts in our individual quest for happiness. He observes that philosophy too lost its function as a source of wisdom and is restricted merely to knowledge. Philosophy's success is its ability to give birth to different sciences. The idea of the regeneration of human person, the formation of a just and happy society etc., which were preoccupations of philosophy in earlier times, no longer holds good in the present day. Science has lost its search for wisdom. It being analytical often gets lost in the inexhaustible search for complexity and minute details. Ricard quotes the Arab phrase, 'once you start counting you can never stop it.' Ricard is of the opinion that spiritual practice is based on experiential exploration and its discoveries are to be pushed as far into the inner world even as science pushes its explorations into the outer world. The explorations of the mind are always fresh, and they are ceaselessly renewed.

Buddhism, according to Ricard, aims at recognising truth at all levels, inner and outer. But it establishes a hierarchy in which material development without spiritual nourishment can only lead to discontent. Instead of wisdom, if society bases its foundation on information, technology, such a civilisation becomes nostalgic and violence ridden. The nineteenth century Tibetan Monk Mipham Rinpoche had made sketches of flying machines, all sorts of other extraordinary inventions;[6] but burned all his notebooks saying that an inner transformation is necessary rather than invention of machines, and getting lost in everyday occupations. So Buddhism gives priority to the inner world than the outer world. The society can only be transformed by changing the individual. The ceaseless work is to make the individual spiritual and work for achieving others' good. The intellectual games of science, according to Ricard, are of extreme complexity but with a minimum of usefulness. He criticised the scientific progress terming it then as technological psuedo-progress. According to him, the technologically developed factory farming methods have worsened the sufferings of animals which at the same time have been creating new diseases for humans. Ricard discovered that science does not give "meaning to my life ... an endless dispersion into detail ... disillusioned with the research, but in search of a contemplative science."[7] Thus he did not change his carrier as a scientist; he moved from the science of the world to the science of the mind; he found meaning in serving a contemplative science.

Ricard also criticised the West for its vain and frustrating quest for change. According to him, unable to find happiness within itself, the West looks for changes in the externals. As a Westerner he observes that the West has a deeply ingrained preoccupation with novelty, instead of spontaneous expression of intimate feelings. Often the quest for novelty dupes the public and dazzles the naïve. Novelty in Buddhism is the importance given to the present, to the freshness; it relives the present than the lost past or the imaginative future. In the Western tradition, the moral and the spiritual becomes a dimension of wisdom and the West believes in history, progress and productivity in time, a discovery that is always new. According to Ricard, all these are false and the West failed to understand the importance of the spiritual and the mind. Ricard commented that for the last two centuries, the West has taken very little interest in contemplative science.[8]

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[6] Ricard, *Monk*, 161.
[7] Ricard, *Monk*, 4.
[8] Ricard, *Monk*, 46.

Ricard also severely criticizes the reductionist approach of modern science. For him, this atomistic and divisive approach cannot be applied to the consciousness, because consciousness cannot be reduced to chemical and biological structures or neuro-biological models for medical materialism. These models cannot explain the mechanism of decision making; "if man is no more than his neurons, it's hard to understand how sudden events or deep reflection and the discovery of inner truths could lead us to completely change the way we see the world, how we live and our capacity for inner joy."[9] The killings in Bosnia, Rwanda, and other conflicts could also not to be explained in terms of these neuro-biological models.

The West, according to Ricard, indicates a pointlessness of life and lacks meaning. Till seventeenth century, the West has had the 'torch of reason." The philosophy of enlightenment was accompanied by hope based not only on the expansion of science but also on the necessity for widespread education. A concept of compulsory schooling – secular and free – has established the society. The basic weakness of this science oriented education is that it cannot make a human a better person. The science of the West is preoccupied still with the tangible phenomena by improving the external conditions only.[10] This affects, however, the quality of life and the emphasis on externals has eroded the mental and spiritual and the Western culture lost its moorings. So Ricard perceives that the spiritual has to be re-rooted for a meaningful life in the Western society.

On the other hand Jean Francois Revel, Ricard's father was a member of the French Academy. He was born in 1924. He wrote the famous books, *How Democracies Perish: Without Marx or Jesus*. He was the editor of the French weekly newsmagazine, *L'Express*. As a philosopher and political scientist, he always sought perennial alternative to religion. He was also a formidable proponent of Western individualism and secularism. He was upset about Matthew's decision, but continued his contact and did not fall out with him. His questions arise from these foundations of Western scientific objective outlook that has a natural suspicion for any religious phenomena.

According to Ricard, the West has never encountered a contemplative science, but it developed the natural sciences and hence ignored and continues to do so the contemplative science. He might have been forgotten about the Christian past of the Western civilization as from the religious spirit the rational scientific objective outlook germinated.

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[9] Ricard, *Monk*, 59.

[10] Ricard, *Monk*, 350.

Ricard quotes Einstein's prophetic words as meaningful proposing that the religiosity and spirituality would return to humanity when he said,

> ... the religion of the future will be a cosmic religion. It should transcend a personal God and avoid dogma and theology. Covering both the natural and the spiritual, it should be based on a religious sense arising from the experience of all things, natural and spiritual, as a meaningful unity.[11]

According to Ricard, Buddhism accepts the discoveries and doctrines of the modern science, and it does not accept any metaphysical claims such as possessing an ultimate explanation. Buddhism won't change its point of view because of the change in scientific discoveries; its concept of a just society is based on spiritual values, rights and responsibilities of the individual. Totalitarian regimes and systems have failed miserably due to the restriction of the individual freedom, instead of, instilling in them, a sense of responsibility.

Revel thinks that the theoretical foundation of Buddhism seems to be unproved and unprovable. Through the conversations, Revel discovered that Buddhism is not at all passive and the notion of inaction is a myth. Though the West has triumphed in science, according to Revel, it is not at all guided by wisdom or ethics. Instead of spirituality, Revel considers ethics to be the meaning giving mechanism of the society. But he observes that though the East brings an ethics, it is devoid of rational foundations. Buddhism, according to him is more intuitive and lacking in intellectual content. Eastern wisdom is not based on scientific certitude, and scientific certitude does not lead to wisdom. For him, both are indispensable and complementary.

Ricard on the other hand concludes that happiness is not just some agreeable sensation but the fulfilment of living in a way that wholly matches the deepest nature of one's own being. When we do not know how to give meaning to life, it leads to frustration and discouragement, instilling a sense of futility that may even lead to the ultimate failure, suicide. The unhappiness or feeling of failure is due to the persistent dissatisfaction dominating the mind. This dissatisfaction comes from the inability to overcome the mental poisons of hatred, jealousy, attachment, greed, pride, etc., which arise from a self centred vision and the attachment to the idea of the self. Buddhism is, therefore, a science of the mind, a contemplative science, more in tune with our times than ever. Buddhist path is designed to make better human beings. Science has neither the design nor the means to help us attain that goal. Its attempt is to understand the tangible phenomena and to control it and utilise the technique to facilitate material needs. Science can improve the conditions of life. Buddhism does not coerce a person to follow the path; but gently invites him without dogmatism.

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[11] Ricard, *Monk*, 279.

Both, the scientist monk son and the philosopher father respect each other, but the two are in sharp disagreement about the issues that each of them considers to be of importance. Ricard perceives the necessity of a contemplative science transcending the relative truth of the phenomenal world reaching out to the eternal truth which can only serve as the antidote to the material, meaningless approach of the West. However, the intellectual and irreligious Revel disagrees and suggests that religion especially lacks intellectual content. These conversations open up one's mind to an intellectual dialogue on the rational, scientific and religious foundations of civilizations as well as on the development of the individual self. It choreographs the future course of action and integration of science and religion for a better humanity.

5. The Diagnosis of a Crisis

There is a general awareness that in our planet everything is not going on well. The progress in our living standards provided by the technical innovations brought environmental and ecological problems. The relationships between individuals, societies and cultures are generally considered to be loosening. More and more groups of people, politicians, philosophers and philanthropists are aware of and concerned about the breaking down of relationships among cultures, societies and individuals. Fredric Jameson observed that a sense of crisis permeates the Western history after the sixties,[12] including the crisis of the social democracy, welfare state, Western culture etc. Constant refrains of the end of philosophy, history, ideology, art, social class etc., are aired by social critics and philosophers.[13]

Edmund Husserl, the illustrious founder of the phenomenology, in his celebrated work "*The Crisis of Western Sciences and Transcendental Phenomenology*" argued that the Galilean style of science thrown the Western culture and knowledge tradition into an inescapable crisis. Galileo is the centre of this article, which was the result of Husserl's last years of labour and published as a book later. He died without completing it. As an antidote to this disease of crisis, Husserl proposes his phenomenology and the life world. Husserl caricatured Galileo as the symbol of the whole of the Western science rather than accusing him of any particular events or theories he had put forward. He knew very little of Galileo, but he was attacking the science Galileo inaugurated.[14] Husserl found it as a serious problem that the direct mathematization and geometrization of nature without taking into account the inextricably intertwined life-world which according to Husserl, catapulted the modern world to a deep crisis.

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[12] A series of crisis are narrated in F. Jameson, *Postmodernism, or the Cultural Logic of Late Capitalism*, Durham, USA: Duke University Press, 1991.

[13] Derrida narrates a series of ends in his essay "Of an Apocalyptic Tone Recently Adopted in Philosophy."

Husserl summarized the argument against science as the *technization* of nature.[15] He delved deep into the general lament about the crisis in European culture and discovered that the root cause of the crisis was due to the Cartesian self doubt and scepticism of the philosophico-historical origins of the culture. Thus Husserl attempted to give a solid foundation beyond doubts that might become the corner stone for all disciplines which he called as phenomenology. Thus he set out to arrive at the essence of things at the realm of pure consciousness through a method consists in epoche – a series of reductions, namely phenomenological, eidetic and transcendental reductions. Heidegger turned the Husserlian bracketing methodology from the content of investigation into the how of investigation and arriving at the thing in itself or the disclosure of the being. The glorification of the reason inaugurated by the modern philosophers reaching to its zenith as scientific rationality is thus thrown away to the dust bin of history by Heidegger. He accused science of squeezing the essential characters of humanness and turning it into a need based product that could be fabricated. Thus he condemned science and technology with a tendency of calculation, machination and compositing and imposing its coercive forces on being undermining it as annihilable and coercible. The criticisms of Ricard, must be seen in the background of the analysis of the Western culture and its imposing dominance by science and technology as illustrated by Husserl and Heidegger.

Husserlian criticism against science was further developed by Heidegger and other phenomenologists who attacked the positivist special position given to science as the refinement of rationality and every other discipline especially philosophy to be modelled after science. Husserl's disciple Heidegger extended this analysis of the cultural crisis and blamed that it is due to the ascendency of science as calculative manipulation and it lacks meditative thinking which was practiced in the Greek life world. According to Heidegger the root cause is the oblivion of the Being and he made a clarion call for being aware of the presence of the Being. From the tradition of science itself, philosophical critiques of science like Thomas Kuhn, Feyerabend, Michael Polyani and others claimed that science has nothing special from the other human disciplines and even dethroned the rationalism of science itself and claimed the scientific method itself is to be at fault. An extreme position was taken against science and Galileo by Karl Friedrich von Weizaescker that the ultimate blame of developing the atomic weapon would fall on Galileo because of his development of the scientific methodology.[16]

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[14] Aron Gurwitsch, "Galilean Physics in the Light of Husserl's Phenomenology" in McMullin, *Galileo Man of Science*, Boston: Basic Books, 388-401, 391.

[15] Gurwitsch, "Galilean Physics in the Light of Husserl's Phenomenology," 391-97.

6. Root Cause of this Impending Crisis

Is science at the root cause of the crisis as envisaged by Husserl and his adherents like Heidegger? *Techne*, according to them, is misunderstood and its over emphasis led the civilization into a mere calculative machines. There are others who go further into the philosophical foundations of science and criticises the Cartesian dualism as the root cause of the crisis. Fritjof Capra[17] and many others[18] found the root cause of the Western cultural crisis as the Cartesian mechanistic and dualistic epistemology and imagination. However, I suggest that it is due to the bifurcation of the reality into the phenomena and noumena by Kant and the gradual development of the analysis of the phenomena exclusively at the expense of noumena eliminating it from the totality of the human sphere and even blindly blocking and negating the ability of human reason even to investigate it.

7. Kantian Fragmentation of the Reality

In order to comprehend the plurality of things and manifoldness of expressions, humanity proposed some principles. Both in the East and the West, they proposed certain building blocks like fire, air, water, earth and space as the constituents of this myriad manifoldness and thus derived a rational explanatory principle. The atomists both in the East and the West brought forth the explanatory theory of atoms to answer the multiplicity they experienced in this universe. Thus Democritus in the ancient Greece and Kanada in the ancient India proposed the atomic theory of indivisible atoms moving in the empty space colliding and structuring sustainable forms. *Purusha* and *Prakriti* of the Samkhya in ancient India and Heraclitus and Parmenides of ancient Greece emphasized the dual aspects of change and permanence as the ultimate principles of the universe. The abstract *apeiron* of Anaximander of ancient Greece paved a mathematical and abstract method of explaining the plurality experienced in this universe. In the Western tradition, Socrates gave a humanistic twist to this materialistic natural description of the universe by introducing knowledge and ethics and the importance of human life while in the Eastern tradition, Buddha, Jinna and other spiritualists negated the materiality and upheld the spiritual transformation of the human person as the ultimate aim of life. So in the East, the spiritual transformation became the paramount investigative strategy leading to a total oblivion of the material reality.

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[16] Karl Friedrich von Weizsaecker, *Die philosophishe Interpretation der modernen Physik*, Deutsche Akademie der Naturforscher Peopoldina, Halle, 1989.

[17] Fritjof Capra, *The Turning Point*, New York: Simon and Schuster, Bantam Paperback, 1983.

[18] Orla O'Reilly Hazra, *Evoking the Spirit to Practice Religiously: Somatic and Narrative Ways of Knowing for Transformative learning in a Living Tradition*, PhD Dissertation, Fordham University, 2009.

In the West, Plato took the abstract, mathematical interpretation of the universe of his predecessors and refined it into the theory of the world of ideas that is eternal and perfect while the terrestrial life as a shadow of the life in the World of Ideas where everything united with the One, the Good and the Beautiful, which in Indian categories as Sathyam, Sivam, Sundaram. However, his disciple, Aristotle blended the three different streams of thought, namely the abstract – mathematical, the imaginative – tangible and metaphysical into a single whole, providing a holistic vision. Thus a fusion of physics and metaphysics is visible in his interpretation of the universe which became the foundation and bulwark of the western theology, philosophy and science.

Unlike Plato, Aristotle accepted the dual aspects of permanence and the flux of the reality as a fact even in this universe and in this life itself. He did not consider and explain the reality as existing somewhere outside the earth as pertinently described by Rafael's immortal painting where the two masters are debating with the raised forefinger of Plato pointing towards the heavens showing the reality as out there while Aristotle asserting by his palm that the reality as here, down to earth and now. Aristotle, the greatest intellectual of all times, compiled, fused and integrated all the knowledge of his times into a whole. Thus the Heraclitan flux, the Parmenidean permanence, the Anaximanderian abstraction, the naturalists, five elements and the structural forces and the Eudoxian circles, the common experience of the motion of the sun and the day and night along with the fall of objects were unified into a system of thought known as Aristotelian physics. Thus Aristotle reconciled the Platonic abstraction of the perfect world of ideas and the naturalistic empiricism of the Pre-Socratic philosophers through his division of the universe into the terrestrial and the celestial and designating different physical laws operating in these diverse levels.

Continuing his explanation of permanence and change in this universe, Aristotle developed four metaphysical principles – essence- existence, form-matter, substance-accidence and act-potency – in order to explain the permanent and changeable features of the universe. In explaining the polar opposite features of the universe, namely, change and permanence, Aristotle introduced the four causes, namely material, efficient, formal and final causes. For Aristotle, the most important cause is the final cause that is providing the purpose of the whole process. Thus, the purpose defines and guides the whole process and gives a meaning to it. Thus every process in this universe has a purpose and even every human action has a purpose. This concept of purpose gives the holistic outlook to the Aristotelian vision. Every tree grows with this purpose and this purpose gives it an organic development. There is a proportion between the parts and there is an overall guidance to its growth. This organic whole controlling and guiding the parts is very much the foundation of the Aristotelian physics and metaphysics. The whole is more than the parts and an assembly of the parts will not get the whole. This concept of holism is lost in the further development of humanity. The Aristotelian causal system is reduced into an instrumentalist dynamics by the development of science, paving the way for secularism, objectification, fragmentation and pragmatism.

Aristotle observed that his physics was unable to describe the totality of the universe and thus introduced the meta-physics. From the geocentric cosmology of a centre that is static and giving impetus to the motion of the planets, Aristotle proposed a mover that is static and stable yet imparting motion to everything else. Thus he introduced a metaphysical uncaused cause to complete the system of thought observing that such an explanation is necessary for completion. Aristotle found the insufficiency of physics in giving a complete description of the universe and thus took refuge in going beyond it, anchoring his thoughts in meta-physics and proposing the uncaused cause.

In the development of Western thought, the next colourful stage came in the middle ages through the profound fusion of faith and religion with these Greek philosophical investigations. The Jewish religion and its offshoot Christianity penetrated the Greek philosophy and Roman culture during the middle ages. The Jewish concept of God, Yahweh and the Jesus Event together form the core of Christianity. The Christian salvific mystery was fused with the Roman culture and Greek philosophy paving its way for the European or Western culture. St. Augustine used the Platonic philosophy to interpret the Christian faith rationally while St. Thomas Aquinas used the Aristotelian philosophy. Till the 12th century the Augustinian Platonic idealism influenced the Western Culture while after that the Thomistic system of thought termed as Scholasticism took over the Western Culture. St. Thomas Aquinas identified the uncaused cause and the unmoved mover of Aristotelian metaphysics with God and rationally interpreted the Christian faith. Thus through Scholasticism, Aristotle gave the rational foundation to the Western Culture which is predominantly Christian. Scholasticism was thus, a stunning fusion of faith and reason or religion and philosophy. Aristotle and St. Thomas gave the best model for a holistic description of the totality of reality, that is, developing physics and transforming it into metaphysics and utilizing that metaphysics to interpret the encounter between the divine and the human relationship with the divine. There are not many such exemplary models of philosophizing and theologizing after Aristotle and Aquinas.

Due to the over influence of Scholasticism during the medieval period, the Aristotelian geocentric cosmology and metaphysics were identified with faith and any challenge was considered as a heresy and schism and was heavily punished. Thus, the identification of the Christian doctrine with Aristotelian metaphysics became the characteristic feature of the middle ages. Nature was seen as created by God and is intelligible to human reason who in turn was created in His image. Thus nature was interpreted with an inherent order and regularity while the human reason was endowed with the power to penetrate and understand it. The assertion of the existence of the material reality with an inherent order capable of being interpreted in regular patterns was a great contribution in the intellectual growth of humanity. Compared to other cultures like India which denied the existence of matter, this basic presupposition made the difference in the development of science in the West. However, the Church authorities fought with tooth and nail any deviations from the Thomistic-Aristotelian system of thought blindly believing that it formed the foundation of Christianity.

Copernicus doubted and challenged the existing geocentric description of the universe because of the recurrent problem of the shift of Christmas to autumn instead of winter and Easter to winter instead of spring. This problem led the astronomer Copernicus to seriously doubt about the geocentric description of the world and to come up with an alternative sun centred scientific vision. It was Galileo who single-handedly fought for the promotion of the Copernican heliocentrism and the creation of a methodology of science by blending mathematics with experiment rejecting the Aristotelian logic. Thus Galileo corrected the geocentric view of the medieval period that integrated with the Christian faith and suffered due to the ecclesiastical politics purporting a conflict with the nascent science and the established Church. During the beginning of modernity, scholasticism was attacked by the visionaries. The whole agenda of scholasticism was reduced to reflections and debates on God, salvation and sin absolutely forgetting the nature and human life here on earth by mediocre elements interpreting commentaries on commentaries on Aristotle. The visionaries criticized the methodology, object of thought and proposed that there should be an emphasis on the study of nature and a new language should be developed in describing the world. They called for experimental evidence as the true methodology of acquiring and processing knowledge based on induction rather than the self evident axiomatic deductive methodology of Aristotle. They proved how Aristotle was wrong in many sense as he often made conclusions without basic investigations. They argued that mathematics as the new language of science and nature the object of its thought so that the dynamics of nature could be understood and thus humanity could control and manipulate nature facilitating human life. Galileo, Leonardo Da Vinci, Cardinal Nicholas of Cusa, Descartes, Francis Bacon, Thomas Hobbes were some of those intellectuals who proposed for a shift of emphasis from God to nature. Bacon criticised the tribal social culture as a stumbling block for human progress and advocated for the elimination of these faulty individual and social habits. Thus the idols of the tribe, cave, market place and theatre were criticised and caused a social restructuring that paved the way for the renewal of the society. Because of this theoretical input and the continuous emphasis on the elimination of the tribal outlook transformed the highly tribalised European society and paved for a universal outlook based on humanism and its rapid growth. This renaissance spirit separated theological reflections on God, soul and salvation from philosophical investigations on the nature. In modernity the rise of reason is visible and its ultimate ramification and refinement as scientific rationality is known as renaissance.

Cartesian doubt and search for the clear and distinct ideas proposed atomism as a methodology for the investigation of nature. He divided even human person as body and mind, the extended being and thinking being and called for an infinite division of material reality which paved rich dividends in humanity's search for its understanding and controlling of nature. The rapid growth of science and the rich facilities we are enjoying due to technology are because of this philosophical vision and shift of emphasis that caused a social upheaval. Most of these intellectuals who steered the modernity were strong believers and it is their faith that catapulted them to study nature as the handmaid of God and to discover His splendour and Majesty in nature. Kepler, Newton, La Place and other such intellectual giants extended the philosophical vision on nature into scientific practice and discovered the dynamics of nature and engineered gadgets facilitating life in an unforeseen way.

Immanuel Kant investigated on the power of reason and its limits introduced by scholasticism and emphasised by modernity. Kant divided the reality as noumena and phenomena and observed that reason could not penetrate noumena and it is beyond any rational investigation. However from the practical perspective, noumena behave as a regulating mechanism though the rationality could not get hold of it. This fragmentation of the reality into noumena and phenomena and the existence of the noumena as a mere regulating mechanism devoid of authentic ontic existence and the inability of the human mind to describe, understand and realize became the foundation for the gradual overthrow of the noumena itself. Science concerned only with the phenomena and the ontic search for the beyond as envisaged by Plato and Aristotle have been eliminated along with the reduction of the four causes of Aristotle into an efficient cause, a mere instrumentality rejecting the paramount purposiveness from the whole realm of metaphysical investigations. The ontic source as noumena and its connectivity with the phenomena and the ability of the human mind to understand, describe and reach out to it for meaning has been eroded. This euphoria about the ultimate power of human reason led science to deny any metaphysical reality beyond its experimental objectivity. Thus Laplace interpreted God as a mere hypothesis which has no place in the description of the world. Thus the dogmatism that choked the nascent science turned the other way around denying and dismissing faith and religion as useless jugglery empowered by the enormous success of science and technology and its megalomaniac expression known as scientism.

Kant also detached morality from religion and developed an ethics based on the autonomy of the conscience and an action oriented ethics founded on the categorical imperative eliminating the reward and punishment mechanisms integrated with religion offering either the heavenly bliss for the good actions and the hell fire for evil conduct. Though this detachment between religion and morality was proposed by Kant with a good intention, morality paved the way for ethics which ultimately guided by the utilitarian epicurean principles. Thus, euthanasia is promoted when someone is at pain, a foetus is aborted for the comfort of the mother, promoting the concept of controlling the body, surrogate motherhood, sperm-ova banks all leading to a an ethics of convenience. Now instead of ethics the oft spoken phrase is corporate responsibility. Thus the evolutionary development of morality endowed with the connectivity to an ontic reality is eliminated catapulting it to ethics and finally to a mere responsibility devoid of a relatedness to a deeper dimension of reality.

The Newtonian physical laws and the law of gravity paved the way for a mechanical interpretation of the world rejecting the Aristotelian holistic outlook. The intellectual engine for the penetration of the dynamics of nature and the description of it in terms of physical laws were the Cartesian doubt and the Kantian fragmentation denying the human mind to reach out to its own ontic source. Knowing as merely determining the phenomena and engineering it became the sole interest of reason that catapulted a science of mechanism and determinism moulding the Western civilization into a philosophy of using, abusing, misusing and overusing the nature and leading to the present ecological catastrophe and resource crunch leading to again an investigation into the foundations of Western culture and science.

As the scientific rationality was making quantum leaps, the nature and human life suffered a setback. Nietzsche inaugurated the onslaught on the basic foundations of the Western culture by proclaiming the death of God. When Nietzsche cried aloud the death of God he intended that the inherited notions of God and the world views were not life promising and hence to be replaced by a human spirituality based on the will to power. Nietzsche was not criticising the Christian religion alone but even more savagely the foundations of the Western science itself. When religion said that God was eternal, science replaced it with the slogan that matter as eternal and thus both religion and science gave an impoverished image of man. Nietzsche charged that both science and religion utterly failed to recognize the power inherent in the human and called for a radical renewal and rediscovery of human nature. He was introducing a Socratic criticism to the whole endeavour of knowledge. Religion and science according to him, instead of anchoring man at the centre of the life world misplaced him with God and matter erroneously and had done irreparable damage to the destiny of man as chaotic and indeterministic. Thus the rational foundations of the modernity based on the Cartesian doubt and the Kantian fragmentation was moved a step further by Nietzsche through the rejection of the ontic source, noumena or truth out rightly.

What Nietzsche inaugurated was augmented by Freud and Marx, the other two masters of suspicion. Freud interpreted the reality as mind while Marx as matter. Freud exposed the hidden dimensions of the mind and interpreted the vital human drive as sex and criticised religion as creating conflicts in the mind through its dogmatic insistence on the dos and don'ts. On the other hand Marx proposed that religion is opium keeping the social system intact without changes eliminating protests and interpreting the reality as physical, mundane and material rejecting all dimensions of transcendence. Continuing this tradition, science marched on enquiring the phenomena alone as the totality of reality and denied existence of any metaphysical entities as unobservable and hence non-existent. The success of the science and technology in describing and manipulating matter, life and mind in the twentieth century gave an euphoria to reject all dimensions of transcendence and any connectivity with a noumenal and ontic reality.

As we entered into the twenty first century, science and technology drove its fists against organised religion through the works such as *The God Delusion* by Dawkins, *the Grand Design* by Hawking etc. The accusation that religion is against science and it blocks every scientific progress and hence altogether stunts the progress of humanity is not a recent one. Vociferous criticisms and attacks against religion especially against the Catholic Church by the Communists all over the world, especially in India, and by philosophers like Daniel Dennet and by scientists like Richard Dawkins, and by writers like Anne Rice in the West have also become shriller these days.

8. The Necessity of a Holistic Approach

Science presents itself, in each culture, as reason, as complimentary and corrective to the mystical and mythical world-picture. It aims at improving society with a new-world view eliminating superstitious beliefs and brings about a better understanding of the universe and life. It will also aim at transforming that knowledge into technology to improve human life style. However, faith provides a meaning and purpose to the world-view created by science and science in turn becomes a corrective to the mythical world-view. As Jan Hilgevoord correctly observes, "the cosmology of the Old Testament is essentially mythical in character. The world is viewed as a three storied structure, with the earth in the centre, the heaven above and the underworld beneath. All this is the language of mythology, and the origin of the various themes can be easily traced ... To this extent the *kerygma* is incredible to modern man, for he is convinced that the mythical view of the world is obsolete."[19]

As we reflect about the future of philosophical and theological pursuits in the twenty first century, the rejected reason by Post-modernity is to be rehabilitated. Reason can be almost identified with that of contemporary science. Science is being revealed in the epoch making discoveries about nature. Along with the book of revelation, the book of nature is to be adequately studied. As Aristotle and Aquinas pioneered the way in developing a synthesis of reason and faith, by moving from physics to metaphysics and to theology is the best example of creating a theology. As seen, Aristotle could not explain the dynamics of the physical universe in terms of his physics alone and therefore he transcended it and found an adequate explanation in terms of metaphysics, the unmoved mover and the uncaused cause. Later, this metaphysics became the foundation for theology in interpreting Christian faith in terms of Aristotelian philosophical rational categories. Thus, both Aristotle and Aquinas have shown the best methodology for a holistic description of the totality of reality. Science is the explanation of the dynamics of the world in terms of physical categories proceeding through trial and error methods without the possibility of postulating a goal. Religion, on the other hand, is certain about the beginnings and the end of the universe as the transcendent reality called God, and explains with absolute determinism. Thus, science is the thesis, the other of metaphysics which is the anti-thesis and together synthesized and arose towards a religious faith to give an adequate synthesized holistic explanation for the universe and human beings with a complimentary transcendent outlook which science is devoid of and an empirical character which religion is deprived of.

Aristotelian metaphysics and the Thomistic philosophy and theology are based on a common sense view of the world, an almost 2000 years old world vision that prevailed in the medieval period. A logical encounter of science and theology did not happen due to the mutual suspicion and the initial hegemony of religion and the later arrogance of science. The common sense view of the world was eliminated and replaced by Galileo, Descartes, Kepler, Newton, Faraday, Maxwell and thousands of other scientists. This classical vision of nature was again refined by quantum mechanics and the theory of relativity in the twentieth century. Today in the twenty-first century, human genome project, nano-technology, genetic engineering, brain-mind, artificial intelligence, etc. are revolutionizing human conceptions about the universe and about human nature. As Pope John Paul II observed, in the beginning of the twentieth century science has given us great hope. However in the beginning of the twenty first century, because of the explosions in science and technology, instead of the silver lines of hope, the dark shades of horror is visible in the horizon, calling for a radical renewal of our vision of science and technology. The ecological crisis is alarming and even threatens human existence. The introduction of genetically modified food materials is transforming the genes of humanity and the rise of cancer and other uncontrollable diseases are an index of the defects of unbridled science and technology. It is religion that can make a meaningful critique of science with its transcendent approach and its role as a meaning giving mechanism. Religion could play the role of the Old Testament prophet who boldly critiques the society and the king when they derail from the expected path. Thus, if science, technology and theology can come together, giving a holistic outlook, it can solve many of the hard pressing problems of humanity. When this new scientific world vision is integrated into reformulated philosophy, which in turn transformed into theology, this synthesis will definitely become intellectually stimulating and will be in touch with the today's reality capable of tackling the unsolved problems arising out of the lack of value and meaning.

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[19] Jan Hilgevoord, *Physics and Our View of the World*, Cambridge: Cambridge University Press, 1994, 10.

The whole enterprise of science was begun by the visionaries like Copernicus, Descartes, Galileo, Kepler, Newton who were very devout Christians and they conducted their research in service of God and as a search to find Him through the creation. They developed the science on a prayerful reflection and placing their hope on a transcendent God and discovered him through the patterns and regularities inscribed in nature. However, gradually, the underpinning religious experience as the starting point for science was eclipsed and replaced with a secular agenda of eliminating this experience itself and even denying its source. Thus the scientific enterprise became a self enclosed closure, rejecting the actuality and possibility of the transcendental cause, catapulting to a crisis of truth. This crisis of truth, fed into a crisis of faith which in turn led to the crisis of culture, fragmentation and alienation, which was detected by philosophers like Husserl, Heidegger, etc., though they found different causes. Thus, this crisis has risen to an alarming rate in the twenty first century, and only by a reclaim of truth this crisis can be resolved. Therefore, it is high time that the two bipolar opposites, science and religion, should come together and could resolve this crisis, by developing a new culture of holism and a dynamics of integration.

Therefore, in order to develop a new culture of hope, it is necessary for the religion to encounter the physical and the natural sciences in the model of Aristotelian-Aquinas synthesis, so that the perennial problems of humanity could be resolved. Science as the life facilitating mechanism and theology as meaning giving mechanism could interact with each other fruitfully and work together for progress and prosperity. The problems of today – fragmentation, isolation, crisis of truth, faith and culture – could be eliminated through the fruitful dialogue among science and theology so that a culture of hope and prosperity can be created. Let us look into the possibilities of such an interaction by pinpointing certain areas of development from the physical, biological and neural sciences that explode us with their revolutionary discoveries and conceptual implications.

9. Human Vocation: Co-Creator Making Matter-Life-Mind a Continuum

At this concluding point, let us reflect about what is common among physical matter, viruses, bacteria, plants, animals and human beings? It is difficult to assume that such diverse living things as matter, viruses and human beings have anything in common! The basic building block of the universe, the question that was asked by Thales and Kaṇada is now discovered by particle physics as quarks. Irrespective of matter, life, brain, they are all constructed on six quarks; namely, up, down, charm, strange, truth and beauty. The theory of relativity, which celebrated its centenary, taught us that matter and space-time are a continuum and gravity is the curvature of the space-time. From an energy soup, the big bang expanded from Plank's time – 13.7 billion years ago, formed into granules of energy, quarks, particles, massive bodies like earth, sun, solar systems, galaxies and galactic clusters and all are inextricably interwoven. The universe is bound; yet unbound. Matter curves the space-time and hence bound; the matter is expanding and hence unbound.

To our surprise, microbiology, biochemistry and genetics now vividly show that life, irrespective of virus or human being are all inextricably interrelated, sharing the same DNA. In the beginning, amino acids were formed which evolved into Ribo Nucleic Acid; then through billions of years of its evolution, bacteria, fungi, plants, worms, fishes, dinosaurs, apes and ultimately humans emerged out of it. It was an evolution though undertaken by nature, guided by the providence of God. When the universe was 10 billion years old, the RNA could grow larger in size; it would disintegrate and form again. Through trial and error, a new form of RNA, a streamlined RNA – Dioxy Ribo Nucleic Acid, DNA was formed. In order to be assembled faster, three letters of DNA combined together with a tag for easy recognition. These tags combined together to form amino acids and later they joined together to make genes and they in turn form chromosomes and ultimately stored its genetic code in DNA. These interconnections are still visible in cells. The three letter genetic code is universally found in every creature. CGA-arginine and GCG-alanine are in bats, trees, humans and in beetles. All life is thus inextricably interwoven, mosquito, mouse, pig, cow, gorilla, chimp, man are all belonging to the same biological family, are distant or close cousins, a biological continuum. Recent discoveries in the book of life prove this simple fact that the history of the struggles of life is enshrined in our cell and life forms, irrespective of whether viruses, bacteria, plants, animals or human beings, are all inextricably interwoven. All life forms share the same genetic materials and evolved from the simple to the complex. The recent studies in genetics reveal the intimate facts of life as well the mysteries of its evolution integrating the Mendelian Genetics and Darwinian evolution into a systematic synthesis.

Cognitive science, a bundle of research disciplines, namely, Neurophysiology, Computer Science, Artificial Intelligence, Philosophy of Mind, Linguistic Philosophy, Sociology, Psychology, Computer Science, Mathematics, Philosophy, Physics and Chemistry now looks on the subtle relationship between brain, mind and spirit and working hard to mimic the brain processes to create intelligent behaviour and to understand the mystical experience. An inextricable connection is discovered among, brain, mind and the spiritual experiences.

Now nanotechnology, neurotechnology, biotechnology, information technology are coming together to diminish the inter phase between matter, life and mind. Life is absolutely an information system. The Human Genome sequencing and biotechnology elucidate that life is run by the information in DNA and controlled by the genes inside it. Information technology is developing artificial intelligence using nano chips that could be implanted in the human body. These new technologies are the tools for continuing the creation and making it a continuum. The Supreme Intelligence guides the natural forces to evolve into a continuum and the human vocation is to discover it and enhance it. Reason will definitely discover its own limits as Kant has already observed and has to be complemented by faith as Teilhard de Chardin proposed through his illustrious vision.

Thus as quantum relativistic cosmology points out, the evolution of the universe began from a tiny atom, a quantum singularity and it evolved materially through quarks, atoms, elements, gas clouds, galaxies and galactic clusters. Then at a critical threshold, life began in this universe and through an evolutionary process developed into numerous life forms culminating into human life. As life progressed, mind evolved and the complex mental life culminated in the human brain giving him the extraordinary development of consciousness. Thus the universe evolved physically, lively and spiritually and incorporating the evolutionary vision of Lemaitre, Darwin, Mendel and the theological vision of Chardin, the universe began from quantum singularity evolved and collapsed into the Cosmic Singularity, a Superconsciousness, which is indeed divine and incorporates, matter, life, mind and the divine. However, the evolution that happened naturally through billions of years will be now taken over by the creativity of the human consciousness, filling up the blanks and accelerating the move towards creating a continuum. The goal of this evolution and the why of its dynamics are beyond the grasp of science and has to be supplied by metaphysics and religion as envisaged by Chardin, moving towards a Super-consciousness, charting a trajectory from quantum holism towards a cosmic holism integrating science and religion into a holistic union making humans co-creators.

10. Conclusion

In this Science and Religion issue of the *Journal of Dharma*, the first article introduces the intricacies of the science and religion dialogue in general. A French scientist who became a Buddhist monk critiques the Western notions of science and asks for the development of a contemplative science. The crisis of the contemporary culture according to some philosophers is due to the over emphasis of science and technology. Connecting these two facts, I argue that the Kantian fragmentation and the

Cartesian dualism as the root cause that eliminated the ontic concept of truth and led to the scientific understanding of the reality as the only criterion for knowledge and life. An integrated approach of science and religion provides a holistic account of the reality and the human vocation is to be co-creators with God. Archbishop Filipe Neri Ferrao of Goa describes the evolutionary stages of science in which religion has played a conspicuous role. Archbishop Ferrao was delivering his inaugural address for the international conference on science and religion in which he argues the complementary nature of science and religion and invokes both the adherents to come together to solve the problems of humanity. Dr. Victor Ferrao in his article on the contemporary cosmology in dialogue with Christianity illustrates the various conceptions of the universe beginning with the geocentric towards the multiple universes, elucidates the expansion of our knowledge about the infinite universe which almost becoming like a theological speculation. Dominador Bombongan Jr. examines the ecofeminist theology of Rosemary Radford Ruether. The twin domination of nature and woman in the human history is analysed by Ruether showing how through the dualistic epistemological advances how it became the prominent paradigm and proposes an alternative 'God and Gaia' approach to counter this domination. Dennis Vanden Auweele through the article 'God of Gaps' narrates how this approach describes both God and religious practices in a negative way and tries to develop a positive approach. Noreen Herzfeld critically evaluates the cyber man who is living in the cyber space engaging himself or herself in video games, facebook and other activities and his or her image of God. It is an interesting examination of living in the virtual world and issues the web life generates again eliminating the image and experience of God from the life of the human person. Thus, these experiential and in depth articles in this issue of *the Journal of Dharma* on "Science and Religion" gives a historical account of the conflicts between science and religion, broadens the epistemological horizon of the reader and calls for an integrative approach to resolve the imminent problems facing humanity.

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LIVING IN CYBERSPACE

Video Games, Facebook, and the Image of God

Noreen Herzfeld[◆]

My home town, Cold Spring Minnesota, is just a few miles from Garrison Keillor's mythical Lake Woebegone. It's the sort of town where neighbour's look in on each other and doors are often left unlocked. As in Lake Woebegone, the children are all above average. A few years ago, one of those children, 15 year old Jason McLaughlin, brought a .22 calibre Colt semi-automatic to school and shot two of his classmates. As with similar school shootings at Columbine, Paducah, Springfield, the media was quick to note that the boy had been an avid video game player. This could, however, go without saying. In a survey of 778 students in grades four through twelve conducted in December 2003, the National Institute on Media and the Family found that 96% of the boys reported playing video games regularly.[1] A 2007 study of students in grades 3 to 5 showed that boys play video games an average of 14 hours per week, while girls play an average of 4-5 hours. Tween (those ages 8 to 12) and teen boys average 16 hours and 18 hours per week, respectively.[2] Adult players also add to the $10 billion a year industry; the average gamer is 34 years old.

While the guys are playing video games what are the girls doing? Some are playing video games too. Tween girls average 10 hours and teen girls average 8 hours of play per week. On-line social networking plays a much larger role in the social world of young women. MySpace has over 200 million members, most in their teens or twenties. Facebook claims more than 500 million users in all age groups. A recent survey conducted by the Pew Internet and American Life Project found that 64% of

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[◆] **Noreen Herzfeld** is the Nicholas and Bernice Reuter Professor of Science and Religion at the St. John's University, Collegeville, Minnesota, USA. Prof. Herzfeld is educated in both computer science and theology and wrote books like *Technology and Religion: Remaining Human in a Co-Created World, In Our Image*, etc.

[1] David Walsh, Douglas Gentine, Jeremy Gieske, Monica Walsh, and Emily Chasko, *Mediawise Video Game Report Card*, National Institute on Media and the Family, December 8, 2003, 3.

[2] Study by Harris Interactive, http://www.metrics2.com/blog/2007/04/04/video_game_addiction_81_of_american_youth_play_85.html

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American high-school students, both boys and girls, frequently post content on some on-line social networking site.

Marshall McLuhan was remarkably prescient when he wrote in 1964: "The medium is the message. This is merely to say that the personal and social consequences of any medium – that is, any extension of ourselves – result from the new scale that is introduced into our affairs by each extension of ourselves, or by any new technology."[3] McLuhan notes that every extension of our abilities, particularly a technological extension, either amputates or modifies some other aspect of that ability. In other words, our technology shapes us, refining some abilities and curtailing others. Video games and Facebook shape us and shape our understanding of the world, of ourselves, and of God.

What vision of ourselves, the world, or God do we find in cyberspace? To answer this question I will step out of the virtual world for a moment and ask what the Bible tells us about who we are and what we are here for. And there's no better place to start than "In the beginning," in other words with *Genesis* 1. According to the *Genesis* what defines who we are and what we are to do is the fact that we are created in God's image. Interpretations of what this image is have varied over the centuries, yet most can be categorized in one of three ways: as a property that is a part of our nature, most often associated with reason, as a function of what we do, specifically our exercise of dominion over the earth, or as the relationships we establish and maintain.[4] While property interpretations have dominated historically, twentieth-century theologians have focused their attention on function or relationship.

A functional interpretation sees the image spelled out in Genesis 1:26: "Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth." In this view, what we are what we do. Old Testament scholar Gerhard von Rad, in his commentary on Genesis, writes: "Just as powerful earthly kings, to indicate their claim to dominion, erect an image of themselves in the provinces of their empire where they do not personally appear, so man is placed upon earth in God's image, as God's sovereign emblem. He is really only God's representative, summoned to maintain and enforce God's claim to dominion over the earth."[5] This approach has come to dominate the field of Biblical exegesis. We are actors, independent agents in the world, in imitation of God's agency. Video games, immersing the player in a world of action and control, espouse this view of God. But this view has limitations. Exactly what functions are we called to do? How do we know we are acting as God's agents and not on our own narcissistic and sinful behalf?

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[3] Marshall McLuhan, *Understanding Media: The Extensions of* Man, New York: McGraw Hill, 1964, 7.

[4] Some have looked for the *imago Dei* in a quality of the human being, such as our physical form (Gunkel), the ability to stand upright (Koehler), our rationality or intellect (Aquinas), our personality (Procksch), or our capacity for self-transcendence (Niebuhr). Others have thought of God's image as dynamic, rooted in human actions such as our dominion over the animals (Caspari, von Rad). A third approach defines the image as emergent in the interrelationship of two beings (Barth, Brunner). See Claus Westermann, *Genesis 1-11: A Commentary*, Minneapolis: Augsburg, 1984, 147-48 for a summary.

To answer these we need the second approach which sees the image of God as arising in and through our relationships. This places the centre of our humanity in a corporate rather than an individual context; what matters most are the relational bonds between us. One of the most influential proponents of a relational interpretation was Karl Barth. According to Barth, the image of God is identified with the fact that the human being is a counterpart to God.[6] Barth roots his interpretation in a different portion of the Genesis text: "Let us make man in *our* image" (Genesis 1:26) and "male and female he created them" (1:27). Barth interprets the plural in "Let us make man" as referring to the triune nature of God.[7] The Christian understanding of the Trinity presupposes a God who embodies relationship within God's very self. We image God when we too give ourselves over to relationship. Thus no one person can be the image of God; we only image God together. As the African proverb puts it "I am because you are."

Barth also notes the primacy of relationship in the life of Jesus, in whom he sees human nature as it was intended to be. What Barth sees as significant about Jesus is his relationship with God and with other humans. Barth notes: "If we see Him alone, we do not see Him at all. If we see him, we see with and around Him in ever widening circles His disciples, the people, His enemies, and the countless multitudes who never have heard His name. We see Him as theirs, determined by them and for them, belonging to each and every one of them."[8] Barth suggests that what matters is not so much what a human does, but what sort of relationships we are a part of.

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[5] Gerhard von Rad, *Genesis: A* Commentary, Philadelphia: Westminster, 1961, 58.

[6] Barth lists and denies the variety of substantive and functional interpretations in vogue at his time: "The fact that I am born and die; that I act and drink and sleep; that I develop and maintain myself; that beyond this I assert myself in the face of others, and even physically propagate my sperm; that I enjoy and work and play and fashion and possess; that I acquire and have and exercise powers; that I take part in all the work of the race; and that in it all I fulfil my aptitudes as an understanding and thinking, willing and feeling being – all this is not my humanity," Karl Barth, *Church Dogmatics*, Volume 3: *The Doctrine of Creation*, Edinburgh: T. and T. Clark, 1958, 249.

[7] Barth, *Church Dogmatics*, 182.

In video games we experience a primarily functional understanding of the image of God. In simulation games, such as SimCity or Farmville, the player builds and controls a virtual environment. This control is purely external. Here we have a creator god, yet one who is unable to enter into covenantal relationship. In games, such as the Game of Life, the player imitates a Deist god, who sets up the initial laws of the world and then sits back and watches what unfolds; in others, the player can take a more interventionist role, but it is still an external role, that of a *Deus ex machina.*

On the other hand, the player is certainly present within the environment of first person shooters, such as Doom, Halo, or Grand Theft Auto. However, this presence is barely relational. The role of the first-person shooter is that of lone actor in a dangerous world; the premise of these games is a back-story based on revenge. Thus we have a player who imitates a vengeful god, the bringer of a harsh justice to a dark virtual world.

In neither type of game is control or power understood in a relational manner. The danger here is that video games promote a propensity to view oneself, and God, as alone, rather than in cooperation and covenant with others. God and self are understood in terms of power. But as Reinhold Niebuhr notes, "There is a pride of power in which the human ego assumes its self-sufficiency and self-mastery"[9] and this will to power lies at the root of much sin. Individual mastery is precisely the goal of the video game world. To do, and to do better and better. But to see the self only in terms of mastery is ultimately destructive. Chris Magnus, police chief of Richmond California, attributes some violent crime in the United States not merely to gangs, easy access to guns, drugs, and poverty, but also, in part, to video game playing: "there's a mentality among some people that they're living some really violent video game... We seem to be dealing with people who have zero conflict resolution skills."[10]

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[8] Barth, *Church Dogmatics*, 216.

[9] Reinhold Niebuhr, *The Nature and Destiny of Man: A Christian Interpretation*, vol. 1, Louisville: Westminster John Knox, 1996, 188.

There are, of course, multi-player games, which do add a relational component. However, the players must often make decisions too quickly for them to be in any real sense collaborative. In the end, alliances formed by players are frequently instrumental, often shifting, and prone to betrayal. The goal is paramount, more important than the quality of relationships. This is a functional world.

So what about Facebook? If the world of video games is ultimately functional, surely the world of social networks images a relational God. It does, but with some caveats. According to a recent study from the University of Texas, Austin, Facebook makes us more sociable. It allows us to stay in touch with far-flung family and friends, to share news and photos, even to organize uprisings against the government as we have watched recently in Tunisia and Egypt.[11]

Sites such as MySpace or Facebook seem to encourage utter transparency. It is amazing what sort of personal information many users post, from intimate musings to pictures of drinking binges or romantic encounters. Researchers who surveyed Facebook users at Carnegie Mellon commented, "One cannot help but marvel at the amount, detail, and nature of the personal information some users provide, and ponder how informed this information sharing can be."[12] For young users, such transparency can be dangerous. 40 percent of the users surveyed at Carnegie Mellon posted their class schedule, and about one in four posted his or her address. Other users post their cell phone numbers, e-mail address, and even their sexual orientation. One-third of teens using social networks reported that they had been contacted by a total stranger and a significant number felt threatened by this contact.[13] For older users, misjudgement regarding transparency carries other risks. A survey of employers conducted at the University of Dayton found that 40 percent said they would consider using a Facebook profile as one source of information in their hiring process and several reported rescinding an offer of employment based on what they saw on the

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[10] Kate Zernike, "Violent Crime in Cities Shows Sharp Surge," *The New York Times*, March 9, 2007.

[11] http://www.utexas.edu/news/2010/11/22/facebook_research/

[12] Christine Rosen, "Virtual Friendship and the New Narcissism," *The New Atlantis*, Summer 2007, 24-25.

[13] Aaron Smith, "Teens and Online Stranger Contact," Pew Internet and American Life Project, http://www.pewinternet.org/PPF/r/223/report_display.asp

Web.[14] College deans and advisors have disciplined students for underage drinking or other infractions that they found advertised on students' pages.[15] Even if a student herself would never think of posting such a picture on her own page, anyone with a cell phone at a party might snap a picture and post it, often without thinking of the consequences.

On the other hand, while seemingly transparent, social networks are not the unvarnished truth. Accomplishments and personal quirks are all too easy to exaggerate and exaggeration can quickly turn into duplicity. Gossip that might be checked if passed in the real world gains a life of its own. Rushworth Kidder, founder of the Institute for Global Ethics notes:

> What's lost in the shift is a kind of reciprocal correction mechanism. What's missing is the in-person pushback from friends and adults that operates through thousands of visible and linguistic hints, telling young people what works and what doesn't. Calibrating their identities along a scale of courage that runs from timidity to bravura, young people rightly ask themselves, "Am I too brash or too fearful?" Face-to-face interaction sends back highly nuanced and helpful answers.[16]

A recent message by Pope Benedict for World Communications Day, while commending the network of relationships found in the digital world, notes that sociability in cyberspace is no substitute for real life. He writes: "The truth of Christ is the full and authentic response to that human desire for relationship, communion and meaning which is reflected in the immense popularity of social networks." Yet he also warns that one must ask "who is my neighbour in this new world" and avoid the pitfall of being available online while "less present to those whom we encounter in our everyday life."[17] A young woman who spends her evening on Facebook is not spending that time interacting directly with family or friends. Rather than hanging out in the living room or the mall, she is alone in her room. In a two year study of high-school students, researchers found that those who increased their internet use not only decreased time with family and friends but also showed a greater tendency toward loneliness and depression.[18] "Friends" on a social network do not play the same role as friends in the physical world. On-line communication is often truncated to short posts and tends to be more superficial. Without the clues given by tone of voice, body language, and the clarifications that are easy to make quickly in a face to face conversation, we are reluctant to move to the same level of intimacy and self-revelation.

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[14] Smith, "Teens and Online Stranger Contact" [online].

[15] David Eberhardt, "Should Institutions Respect Students' On-line Privacy on Facebook?" *Journal of College and Character*, October 4, 2005.

[16] Rushworth Kidder, "The Hypocrisy of MySpace," *Ethics Newsline*, July 10, 2006.

[17] "Truth, Proclamation and Authenticity of Life in the Digital Age" http://www.vatican.va/holy_father/benedict_xvi/messages/communications/documents/hf_ben-xvi_mes_20110124_45th-world-communications-day_en.html

Social networks can also encourage self-centeredness and narcissism. Quentin Schulze notes that the Internet fosters individualism at the expense of community: "For many people, the real lure of cyberspace is personal expression, not mutuality."[19] Sociologist Duncan Watts notes, "If I had to guess why sites like Facebook are so popular, I would say it doesn't have anything to do with networking at all. It's voyeurism and exhibitionism. People like to express themselves, and they are curious about other people."[20]

Normally we call someone a friend precisely because we share something with that person that we do not share with others. Yet for too many, "friends" in a social network is a numbers game indulged in to promote one's social status. According to Christine Rosen, "Friendship on these sites focuses a great deal on collecting, managing, and ranking the people you know."[21] Many Facebook users list hundreds of friends. Some sites also encourage users to rank their friends, adding another venue for the cliquishness and popularity contests all too common in adolescence.

Careful and loving relationships lie at the heart of all religious traditions. On-line communication can be one way of maintaining and fostering such relationships. However we need to use the medium thoughtfully and not to overuse it. Truly intimate relationships are still best fostered through face to face contact. Karl Barth considered authentic relationship to have four characteristics. First, we must be able to look the other in the eye. What Barth means by this is that true relationship acknowledges the other while aware that the other is distinct from the self.

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[18] Christopher Sanders, Tiffany Field, Miguel Diego, Michelle Kaplan, "The Relationship of Internet Use to Depression and Social Isolation among Adolescents," *Adolescence*, Summer, 2000.

[19] Quentin Schulze, *Habits of the High-Tech Heart: Living Virtuously in the Information Age*, Grand Rapids, MI: Baker Academic, 2002, 182.

[20] John Cassidy, "Me Media," *The New Yorker*, 15 May 2006, http://www.newyorker.com/archive/2006/05/15/060515fa_fact_cassidy?currentPage=all .

[21] Rosen, "Virtual Friendship and the New Narcissism," 27.

Relationship is entered into in a spirit of mutuality, not to enhance one's own status. It is also entered into in a spirit of self-disclosure. This calls for an authenticity that the Web does not preclude, but also does not encourage. Second, we must speak to and hear one another. On-line communication can be one vehicle for this, but we must recognize that without the actual sound of the other's voice we must be even more careful in how we "hear" the other's words. Third we must render mutual assistance to one another, and we must do this gladly.[22] This often requires proximity; it also opens one to vulnerability and a certain amount of risk. Christine Rosen quotes a young woman who writes, "I consistently trade actual human contact for the more reliable high of smiles on MySpace, winks on Match.com, and pokes on Facebook."[23]

Both social networks and video games can be places of encounter. The key is that we must encounter more than ourselves there; these on-line venues need to take us out of our narcissistic preoccupations and into the world of the other. Just as the Christian God is not a solitary being, alone in the universe, but are three holy persons in eternal loving communion with one another, so we image the divine when we experience that same loving communion. The lone actor in a first person shooter, with his focus on power misses this communion. So does the young person who relies on tweets and status updates to define what friendship is.

The world of cyberspace can hone skills, can connect us at great distances, and can help us explore ourselves and the world around us in new ways. But it must be entered with care. When used unthinkingly or overused, our digital pastimes make it all too easy for us to evade the world of true relationship, to settle into a world of self-aggrandizement and distraction, and to miss the true image of God in which we were created.

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[22] Barth, *Church Dogmatics*, 250-263.

[23] Rosen, "Virtual Friendship and the New Narcissism," 31.

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CONTEMPORARY COSMOLOGY IN DIALOGUE WITH CHRISTIANITY

Victor Ferrao◆

1. Introduction

Contemporary cosmology is evolving by leaps and bounds, and along with it our growing understanding of the universe and the challenge of its integration into our faith is felt with profound clarity. This dialogue is already taking place both in science and in theology. This paper is an attempt to carry further this dialogical process and to respond to this imperative of our faith and to bring about a dialogue with contemporary cosmology and the theology of creation.

In the first part of this paper, we make an attentive study of the chief features of the dynamics of contemporary cosmology. The second part of the paper strives to reflect on the process of appropriation of the theology of creation by contemporary cosmology. Finally, in the third part, we take up the challenge of the appropriation of cosmology by theology.

2. Growing Understanding of the Universe

We have witnessed an exponential growth in our understanding of our universe. About five hundred years ago the universe was but a small place, and our home Earth was thought to be its centre. But with the rise of modern science in the 16th century our understanding of the universe underwent a quantum leap. We shall try here to survey the length and breadth of contemporary cosmology. To guide our survey, we shall ask the questions 'where' 'how' and 'when', and try to arrive at the immensity, dynamism and evolutionary history of the universe.

2.1. Geographical Models of the Universe

The evolving histories of the geographical models of the universe manifest how humanity grew in its understanding of the sheer size of the universe. The geography of the universe also illumines the place of humanity in the scheme of the universe.

◆**Dr. Victor Ferrao** teaches Philosophy at the Patriarchal Seminary of Rachol, Goa, and founder director of Science and Religion Sangam. He has a doctorate in science-religion dialogue. He was instrumental in organising the International conference on science and Religion at Rachol in 17-20 December, 2010.

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2.1.1. Geocentric Universe

The geocentric universe comprised of the sun and the five planets (Mercury, Venus, Mars, Jupiter, and Saturn) known at that time. The celestial world was distinguished from the terrestrial realm and was thought to be the abode of gods. Being a divine world it was accepted as the most perfect world and the motion of the planets (understood as gods and goddesses of the Greek Pantheon) was thought to be perfectly circular and uniform. This belief was highly influenced by Plato, Aristotle, and Ptolemy and came to be christened as the circular dogma.[1]

The chief challenge in this closed understanding of the universe was to devise an explanation for the motion of the sun, the moon and the five planets. Aristotle synthesized the efforts of earlier thinkers with his theory of solid spheres.[2] The geo-centric universe was reinforced by Ptolemy. He added the epicycles to account for the irregularities in the motion of the heavenly bodies in the second century A.D.[3]

The geocentric universe was anthropocentric and as such was in harmony with the religious ideas of those days. Enjoying religious legitimacy, it become solidly embedded in the western society and could not be challenged easily. But with the developments in the science and with the use of the telescope the geocentric universe steadily came to be discredited.

2.1.2. The Heliocentric Universe

With the work of Nicolaus Copernicus the hypothesis of Aristarchus[4] was revived 17 centuries after him. Copernicus dependent on a mathematical apriorism opted for the mathematical simplicity of the heliocentric model of the universe in comparison with the geocentric model in his book *Dei Revolutionibus Orbium Coelestium* (1543).[5] The radical nature of this innovation was not only that the earth had to move in order to orbit the sun, but the earth was reduced to one of the planets of the family of the sun, and thus lost its privileged position in the scheme of the universe. Along with the de-centring of the earth, anthropocentrism of humanity lost its firm ground. With the discovery of the moons of the Jupiter, Galileo provided empirical foundation for a heliocentric view.[6] But being an attack on anthropocentrism, his heliocentrism was vehemently attacked by both scientists as well as religious believers. Some scientists like Tycho Brahe opted for a helio-geocentric model of the universe.[7] The ranging controversy raised many tempers and finally Galileo was condemned by the Catholic Church. The work of Johannes Kepler reinforced the heliocentric model of the universe. He dethroned the circular dogma by scientifically establishing the elliptical orbital motion of the planets around the sun. It was Newtonian Mechanics along with the theory of gravity that provided solid scientific explanatory power to the heliocentric model of the universe.[8]

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[1] Arthur Koestler, *The Sleep Walker: the History of Man's Changing Vision of the Universe*, London: Penguin Books, 1989, 53-63.

[2] Koestler, *The Sleep Walker*, 61-65.

[3] Koestler, *The Sleep Walker*, 69-72.

[4] Koestler, *The Sleep Walker*, 50-52.

[5] Koestler, *The Sleep Walker*, 121, 127.

2.1.3. Infinite Universe

Thomas Digges is said to have looked at the Milky Way through a telescope in 1576, and he saw a multitude of stars as stated in his book, *Prognostication Everlasting* that the universe is infinite with stars in all direction.[9] Giordano Bruno is said to have picked up these ideas when he was in England in the 1580s and almost all the scientists of that age were willing to consider the possibility of an infinite universe.[10] It took a long time for these ideas to be assimilated because the technologies of telescope, astronomical photography and spectroscopy were refined and developed later. From the 1920s onwards, these techniques first led to a better understanding of our place in the geography of the universe, and then to a better understanding of our place in the history of the universe.

In 1750 Durham astronomer Thomas Wright argued in his book, *An Original Theory or New Hypothesis of the Universe*, that the Milky Way was a roughly disc-shaped system with a finite size. He described it as analogous to a grinding wheel of a mill and said that the sun cannot be regarded as the centre of the universe. He further pointed out that the fuzzy paths of light revealed by the telescope known as nebulae lie outside the Milky Way.[11] These were later identified as other galaxies. After the 1920s, we have come to know that the Milky Way was indeed a disc-shaped system containing hundreds of billions of stars each broadly similar to our sun, held together by gravity and orbiting their common centre. The Milky Way is about 100,000 light years across. This means light takes 100,000 years across the disc. But the entire Milky Way is just one island in space which houses hundreds of billions of galaxies as visible in principle to the present-day telescope, although only a few thousand have been systematically studied.[12]

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[6] Simon Singh, *Big Bang: The Most Important Discovery of All Time and Why You Need to Know about It*, London: Harper Perennial, 2005, 60-71.

[7] Singh, *Big Bang*, 47-51.

[8] Singh, *Big Bang*, 117-119.

[9] John Gribbin, *In Search of a Multiverse*, London: Allen Lane 2009, 2.

[10] Gribbin, *In Search of a Multiverse*, 2.

[11] Gribbin, *In Search of a Multiverse*, 3.

The geography of the universe shows that we belong to an average-sized member of the class known as disc galaxies, the sun is an ordinary star, one among the hundreds of billions of stars and there is nothing special about our earth. We are indeed living in a vast universe. Nor is there anything special about our place in the universe. Astrophysics has put the Copernican Principle that renders the earth insignificant on a firm footing. But the Astro-biologists point out that the earth has the ability to seed and rear life, and the fact that there are several earth-like planets that cannot host life make the earth special in the scheme of the universe.

2.2. Operational Models of the Universe

Our understanding of the working of the universe has also undergone a sea change. One can notice that humanity moved from a universe that depended on capricious gods to a universe operating on regularities that can be discerned through science. We shall make our journey into the saga of the growing understanding of this world picture.

2.2.1. Pre-Mechanistic World Picture

The Pre-Socratic thinkers made an important paradigm shift from a mythological explanation to a material explanation. 'Gods are angry' was a perfect explanation of natural calamities before the Pre-Socratic revolution. The Pre-Socratic thinkers not only materialized but also rationalized nature. They thought that nature behaved rationally and one can discern the regularity behind its behaviour. That is why they can be regarded as the big bang of science as they sowed the seeds of scientific explanation. The Pythagorean mathematized and the Atomist atomized nature.

We can notice a movement from the Mythos to the Nomos[13] among them. Later thinkers like Aristotle emphasized a telenomy. It meant telos operated as a galvanizing cause, and became an overriding cause that could explain everything in the universe. This understanding of the universe was based on the meaning and significance of things rather than prediction and control. That is why the medieval scientists looked for a purpose underlying various natural phenomena and considered questions relating to God, the humans soul, and ethics.

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[12] Gribbin, *In Search of a Multiverse*, 3.

[13] Robin Waterfield, trans., *The First Philosophers: The Pre-Socratics and the Sophists*, Great Clarendon Street: Oxford University Press, 200, xi-xv.

2.2.2. Clockwork Universe

From 1500 to 1700 there came a paradigm shift in the understanding of the universe. This development was brought about by the revolutionary changes in Physics and Astronomy culminating in the work of Copernicus, Galileo, and Newton. The revolutionary change was based on the new method of inquiry (Novum Organon) advocated by Francis Bacon, that included a mathematical description of nature and analytical method of reasoning conceived by Rene Descartes that was based on a certainty that was mathematical in its very nature.[14] Galileo appears to be the first to combine scientific experimentation with the use of mathematical language to formulate the laws of nature. In order to mathematize nature Galileo postulated the quantifiable properties as the essential properties of material bodies, and taught that the great book of nature was written by God in the alphabet of mathematics. Descartes also believed in the mathematical language of nature, and led him to apply mathematical relation to geometrical figures, and correlate algebra and geometry. In doing so he founded a new branch of mathematics, known today as analytic geometry. Descartes also thought of the material universe as a machine. He believed that nature worked according to mechanical laws, and everything in the material world could be explained in terms of arrangements and movements of its parts.[15] This view of nature as a machine governed by exact mathematical laws became a framework for the scientific enterprise. Newtonian physics became a crowning achievement of this framework. In Newtonian mechanics all physical phenomena are reduced to the motion of material particles caused by forces acting between them. The effect of these forces could mathematically be described by Newton's equation. These were considered fixed laws according to which material objects moved. Newton believed that God in the beginning created the material particles, the forces between them and the fundamental laws of motion. Thus, the universe was a huge cosmic machine that worked like a clock, and God came to be seen as the Chap who wound the clock.[16] Hence, everything in the universe is determinate, and by the same token predictable and accurately discernible through science. The theory of heat and Maxwell's electromagnetic theory carried further the baton of the mechanistic and deterministic world picture in the nineteenth century.[17]

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[14] Fritjof Capra, *The Turning Point*, London: Flamingo, 1983, 37-42.

[15] Capra, *The Turning Point*, 43-49.

2.2.3. Dynamic Universe

The developments in the twentieth century physics derailed the static clockwork Newtonian world picture. The Special Theory of Einstein dealt a death blow to the Newtonian concept of absolute time and space as it showed that time and space make the fourth dimension, spacetime. Time is elastic and hence can be shrunk and stretched by motion. To achieve an appreciable time warp speeds of many thousands of miles per second are necessary. Space is also elastic. When time is stretched, space is shrunk. We cannot notice these effects because they are too small at ordinary speeds, but they can be easily measured by sensitive instruments.[18] Paul Davies states that 'the mutual distortion of space and time can be regarded as a conversion of space (which shrinks) into time (which stretches).'[19] A second of time, however, is worth an awful lot of space – about 186,000 miles per second. Einstein went on to generalize his theory, and led it to embrace the effects of gravity. The resulting General Theory of Relativity appropriates gravity, not as a force but a distortion of the spacetime geometry. The stronger the gravity the more pronounced is the time warp. Thus, Einstein united space, time, matter, and motion which are the fundamental concepts on which the entire edifice of Newton was built.[20] The Quantum theory further dented the Newtonian static model of the universe as the solid atomic particles of Newtonian mechanics were broken into sub-atomic particles. The principle of uncertainty that reigns in the weird quantum world demonstrates that the static and deterministic world of Newton was several light years away at the sub-atomic level.[21] The theory of Relativity and the Quantum theory deal with two different dimensions of the universe. Hence, the need is felt to bring them together so that we can have a complete picture of the universe. Unfortunately we have not yet succeeded in producing a unified theory which can be regarded as a theory of everything (TOE). Physicists Ilya Prigogine and Isabelle Stengers teach that chaos or disorder can organize into a higher order. This has led some scientists to propose that we are living in a self-organizing universe.[22] The holistic picture that is emerging from the twentieth century physics shows that we are part of a dynamic, interrelated, indeterminate (creative) universe.

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[16] Capra, *The Turning Point*, 49-55.

[17] Capra, *The Turning Point*, 57.

[18] Paul Davies, *God and the New Physics*, New York: Simon Schuster, 1983, 120-121.

[19] Davies, *God and the New Physics*, 121.

[20] Davies, *God and the New Physics*, 122.

[21] Davies, *God and the New Physics*, 100-118.

2.3. The Historical Models of the Universe

By historical models of the universe we mean to look at the life history of the universe. Here, we trace the evolutionary history of the universe. The evolutionary history of our universe presents that our universe is 13.7 billion years old. Science today is able to predict its possible fate. But due to our inability to accurately discern the amount of dark matter in the universe we cannot accurately predict the fate of the universe.

2.3.1. The Big Bang Universe

We inhabit a dynamic universe. Everything in the universe has its life cycle. Nothing is eternal. The universe seems to have had a definite beginning in a moment of time. By March 1919 British astronomer Arthur Eddington had proved the orthodoxy of the General Relativity of Einstein. Einstein had already attempted to extend his General Theory of Relativity to the entire universe. To achieve this purpose, he made an assumption that he called the cosmological principle. The principle assumes that the universe is isotropic (which means that the universe looks the same from all directions) and is homogenous (which means to say that the universe looks the same wherever you happen to be. This means that our location on the earth is not unique or privileged). But the application of this theory and its gravity formula to the universe disappointed Einstein as it suggested that the universe is ominously unstable as his formula of gravity showed that every object in the universe was pulled towards every other on the cosmic scale. This predicted a crunch which meant that the universe was destined to destroy itself. Newton too was troubled by a collapsing universe but he overcame it by suggesting that the universe was symmetric, and hence every object would be pulled equally in all directions and therefore the overall cancellation of the forces and hence no collapse. But he soon realized that this equilibrium is only theoretically possible but in practice a slightest change could end in a catastrophe. For instance, a moving comet through the solar system may momentarily increase the mass density resulting in a collapse. Hence, Newton suggested that God intervened from time to time to keep the celestial equilibrium. Einstein did not want to leave it to God to save the collapsing universe like Newton, and introduced a cosmological constant in order to maintain the eternal and static universe which was in accordance to the scientific orthodoxy of his time. The cosmological constant gave rise to a new repulsive force throughout the universe which effectively worked against the gravitational force in a collapsing universe. In some way Einstein seems to have ended up like Ptolemy who introduced his epicycles to save a static geocentric universe.[23]

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[22] Ilya Prigogine and Isabelle Stengers, *Order Out of* Chaos, New York: Bantham Books, 1984, 12.

Alexander Friedman, a Russian mathematician had the audacity to challenge and defy the role of the cosmological constant, and stated that Einstein's theory without a cosmological constant gave rise to a dynamic and evolving universe. Friedman associated the dynamism with the universe that might have been kick-started with and initial expansion so it has an impetus to fight against the pull of gravity.[24] This model of an expanding and evolving universe was very radical and novel in those days and was unacceptable till it was scientifically established by the American scientist Edwin Hubble in 1929. Before that in 1927, George Lemaitre, a Belgian diocesan priest had rediscovered the dynamic evolutionary model of the universe. Theorizing on the physical history of the universe Lemaitre ran the clock backward and arrived at an apparent start of the universe. He taught that the universe began as a primeval atom that exploded and generated all matter in the universe which then evolves over time to become the universe as we know it today. Einstein rejected this proposal in the same way that he had Friedman's theory. It was the absence of evidence that allowed the scientific establishment to be swayed by prejudice, favouring Einstein's static model of the universe against Friedman and Lemaitre expanding the Big Bang Model.[25]

It was in 1929 that Edwin Hubble who earlier in 1924 had shown that our galaxy was not the only one in the universe, provided the evidence through his discovery of the running away galaxies, and so the idea of a static eternal universe came under a tremendous challenge in science. He showed that light from the distant galaxies was not even shifted to the red end of the spectrum and catalogued that the speed at which a galaxy was moving away was directly proportional to its distance from us.[26] The godfather of the Big Bang theory and its die-hard opponent, the famous British astronomer Sir Fred Hoyle along with Physicists, Hermann Bondi and Thomas Gold attempted to resurrect the static model of the universe with the steady state universe. The Steady State Theory taught that the universe had no beginning, but expands because of the continuous and spontaneous creation of hydrogen atoms.[27] But the Steady State Theory was dealt a death blow with the accidental discovery of the cosmic background radiation predicted by George Gamow[28] in 1965 by Arno Penzias and Robert Wilson.[29] This discovery was reconfirmed by the NASA scientists in 1992.[30] The standard model of Particle Physics allowed scientists to reconstruct the Big Bang scenario. The Inflation Theory that claims that the universe expanded enormously, 10^{50} between 10^{-35} seconds to 10^{-33} seconds, after singularity, is widely accepted as integral to the Big Bang theory.

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[23] Singh, *Big Bang*, 144-148.
[24] Singh, *Big Bang*, 150-156.
[25] Singh, *Big Bang*, 156-161.

2.3.2. Beyond Big Bang

The Big Bang theory successfully explains many fundamental aspects of our universe such as the isotropic background radiation, the relative abundance of helium (25%) and other light elements and the velocities of the galaxies. Although the Big Bang model of the universe supports the idea that the universe had an edge in the past, a initial moment of infinite density and temperature which is called singularity, it is applicable to the universe only after the temperature and density have dropped sufficiently. Hence, it is appropriate to speak of this moment as slightly later than the singularity or T=0. Hence, the Big Bang theory successfully describes the subsequent evolution of the universe rather than its origination. The laws of physics as known to us today break down at about 10^{-43} seconds (Planck Time). Before this moment, quantum effects on gravity are not well known. Planck time lies between the singularity and the beginning of our explanations concerning the early universe. Hence, we enter a speculative domain and we have many competing proposals that attempt to describe the scenario before the Planck time.[31]

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[26] Singh, *Big Bang*, 214-229, 249-261.

[27] Singh, *Big Bang*, 337-353.

[28] Singh, *Big Bang*, 306- 336.

[29] Singh, *Big Bang*, 422-438.

[30] Singh, *Big Bang*, 442- 443.

[31] Willem B. Drees, *Beyond the Big Bang: Quantum Cosmologies and God*, La Salle: Open Court, 1993, 41-44.

In this context, scientists depend on the sophistication of Particle Physics and Quantum Theory. As a result most of the proposals are more like visions which guide subsequent research. Some propose that singularity can be seen as conception or birth, being the beginning of time from the perspective of the child, but the same can be viewed as an event as seen by the mother. This analogy can particularly illumine some of the wave-fluctuation models that try to speculate on the origin of the universe. Edward Tryon presents a Big Bang model in which the 'universe is a fluctuation of the vacuum' of quantum field theory. He points that the universe may simply be a fluctuation of the vacuum, the vacuum of a larger space in which our Universe is embedded. Thus he patterns the characteristics of the universe analogically to the ghost-like properties of a quantum system. By 1982 Alexander Vilkin developed and mathematically systematized the vacuum fluctuation.[32]

Andrej Linde, one of the cosmologists who proposed that the universe underwent a rapid period of expansion which is called inflation, supports a kind of chaotic cosmology. His version argues for an eternally existing, self-producing universe. This proposal like other inflationary model is like a ball on a slope: it has kinetic energy which reflects its movement and potential energy, as it can roll further down the slope and thereby gain kinetic energy. The conditions for inflation might have been in some regions while not or only later in other domains. Thus the regions of inflation form what he refers to as bubbles or mini-universe. Hence, the universe as such would not be homogenous but a cluster of bubbles, mini-universes, attached to each other. Linde teaches that bubble formation will continue unceasingly reproducing the universe and making it immortal.[33] Linde's model attempts to account for the spatial expansion in time while fails to consider the evolution of time. The Hartle-Hawking proposal of 1983 takes up the issue of time. In his book, *A Brief History of Time*, published in 1988, Hawking popularized a new theory, based on quantum gravity, that taught that the universe is finite but without time or space boundaries, that is to say without beginning or end. Hawking had presented this 'no-boundary condition' proposal in 1981 in a conference at the Vatican. The quantum theory of gravity puts time and space on an equal theoretical footing, allowing space-time to be finite in extent and yet have no singularities to form a boundary or edge. Thus Hawking proposes that time near the Singularity is very unlike our ordinary time. This means that our interpretation of time breaks down. Hawking points out the similarity between his view and the one of St. Augustine who introduced into the Christian tradition the notion of time being part of the created order. St. Augustine probably understood the beginning of time with creation as an event outside the scope of our natural knowledge. Hawking on the other hand keeps the understanding of the beginning of time within the reach of humanity and uses quantum physics to indicate that spacetime and matter pops up at t=0.[34]

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[32] Mark William Worthing, *God, Creation and Contemporary* Physics, Minneapolis: Fortress Press, 1996, 98-100.

[33] Drees, *Beyond the Big Bang*, 48-52.

2.3.3. The Multiverse Hypothesis

Quantum theories are very successful but their interpretation is still subject to discussion. The Copenhagen Interpretation teaches that it is meaningless to ask what atoms, electrons, and other quantum entities are doing when we are not looking at them. Moreover we can never be certain what the outcome of a quantum experiment will be. All that we can do is to calculate the probability that a particular experiment will come up with a particular result. Some outcomes are more likely, others are less likely, and some others are impossible. When quantum entities are not observed they dissolve into blur (mixture) that is called wave function representing the various probabilities. This mixture is christened as superposition of the states. When a measurement is made, the act of measuring leads the quantum entity to choose one of the states, in line with various probabilities and the wave function collapses. But as soon as the measurement is made the quantum entity returns to a new superposition state. Some claim that the supposition of the Copenhagen Interpretation merely reflects our ignorance (hidden variables). This tension between many possibilities and the (apparently) one actuality was later taken to another startling conclusion by the American physicist Huge Everett. He taught that all quantum states of quantum entity are equally real. This means that from his viewpoint all elements of a superposition are actual. None are more real than the rest. He successfully quantizes a closed system like the universe of general relativity into many worlds. Bryce DeWitt and Neill Graham brought the many worlds interpretation of Quantum Mechanics to the knowledge of the Scientific Community.[35]

David Deutsch takes the Many Worlds Interpretation of Everett at face value but with a difference. Everett taught that the universe would split whenever it is faced with a choice of quantum possibilities, giving rise to an image of a many-branched tree, and the unfortunate hidden implication that there might be a main trunk from where the branches are stemming. But Deutsch prefers a vast array of which all start out same and have identical histories up to a point where the quantum choice has been made. It is like having an infinite library full of copies that all start out in the same way on page one, but in which the story in each book deviates more and more from the versions in other books, the further we read into the book. This position is an improvement on Everett as his position could be described with a single book that split repeatedly into more and more different books as we try to read it.[36]

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[34] Drees, *Beyond the Big Bang*, 52-57.

[35] Gribbin, *In Search of a Multiverse*, 19-35.

Although it is quantum physics that gives a solid scientific basis to the idea of a Multiverse, it is the existence of an array of cosmic coincidences that point to the need for such an Idea in the first place. In 1989 Martin Rees and John Gribbin presented anthropic cosmology in their book *Cosmic Coincidence*s. Martin Rees, a British astronomer, developed the same theme in his book *Just Six Numbers*, where he selects just six cosmic coincidences out of many more to drive home how the hypothesis of a Multiverse becomes scientifically orthodox. The coincidences are considered as essential for the universe to be able to bring about and care for intelligent life. Earlier Brandon Carter in 1973 had pointed out that the presence of humanity may not be central to the universe, yet it is in some sense privileged. We can also trace some kind of anthropic reasoning in Fred Hoyle. Martin Rees teaches that our universe and the law governing it had to be fine tuned to allow our emergence. The stars had to be formed; the nuclear furnace that keeps them burning had to transmute pristine hydrogen into carbon dioxide, oxygen, and irons; a stable environment, and a vast span of space and time, were prerequisites for the complexities of life on earth. Martin Rees sees the apparent 'fine tuning' as indicative of the fact that our universe could be just one member of a countless ensemble of other universes where fine tunings are different. The best analogy is lottery where the six numbers have to be chosen to have a chance of a friendly universe for intelligent life. Our universe happens to be that winning lottery and the other non-winning numbers belong to other universes of the ensemble. It means that we are just lucky.[37]

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[36] Gribbin, *In Search of a Multiverse*, 62-66.

[37] Gribbin, *In Search of a Multiverse*, 36-61.

There is another way of understanding our physical world. Instead of regarding the fundamental entities such as electrons as tiny spheres or mathematical points it thinks of them as loops of vibrating stuff, prosaically called 'strings'. From the mid 1980s there was a growing appeal of this string theory and it was seen as one that will unify the general theory of relativity and quantum theory and lead humanity to develop a theory of everything. Every variation of the string theory works only if the strings occupy more than four dimensions (three dimensions of space and one dimension of time). The theory works with complex mathematics and eleven dimensions (ten dimensions of space and one dimension of time). In the 1990s, there were about five versions of string theory that were considered as competing candidates for the theory of everything. Each of them requires six compactified (curved up into space of very small size or curled to a scale that we cannot see them) dimensions plus the usual four dimensions. There was the sixth theory known as the Super Gravity which required eleven dimensions. Scientists hoped that one of the six would turn out to be better than the rest. But in 1995 Edward Witten, at Princeton, showed that they were all equally good because they were all part of the same thing. He showed that there are ways to transform each of the other implying that they are different facets of some underlying theory, the true theory of everything.[38]

The fact that all the models were different aspects of a single underlying theory meant that the string models like supergravity, actually required ten dimensions of space plus one of time. But time, the eleventh dimension, will not have to be compactified. It can be very big but will lie in the space dimension at right angles to all the other familiar dimensions of space. If our whole universe were represented as a flat sheet of two-dimensional paper lying on our table, this extra-dimension would be at right angles to the surface of the paper, extending upwards in the third dimension. All this brought about a tremendous change in our understanding of the String Theory. Instead of thinking of the fundamental entities as vibrating strings we are now thinking of them as vibrating sheets or membranes, like the skin of a drum. It is expressed in mathematical language where a point is o-brane, a line or a string is 1-brane and the sheet is 3-brane. There are higher dimensions that are expressed as 4-branes, 5-branes or generically p-branes where p can be any number from zero to nine. Witten called the whole ensemble of ideas an

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[38] Gribbin, *In Search of a Multiverse*, 144-151.

M-Theory. No one seems to know what the 'M' stands for. It may stand for 'master,' 'mystery' or 'miracle.' The M-theory has eleven dimensions. But this extra space dimensions cannot be curled in the same way. The mathematics of the theory restricts the manner in which dimensions of the internal space can be curled. M-theory teaches that the shape of the curled internal space determines the values of physical constant, such as the charge of the electron and the nature of interaction between the elementary particles. This means that the shape of curled internal space determines the laws of nature that is the laws of the four forces of nature are determined by the more fundamental laws which are studied by M-theory. Hence, M-theory allows different universes with different apparent laws depending on how the internal space is curled. M-theory allows as many as 10^{500} ways of curling the internal space which means it allows 10^{500} different universes, each with its own laws.[39]

As recently as September 2010, Stephen Hawking and Leonard Mlodinov in their book *The Grand Design* emphatically present the hypothesis of the Multiverse. Along with Edward Witten, Hawking believes that our search for the ultimate theory of everything is over. What we need to do is to understand the mathematical implications of M-Theory. But M-theory is not yet a proper scientific theory and is not scientifically fully tested. At the moment it is just a compelling and beautiful mathematical construct and only one of the numbers of candidates for theory of everything.

3. Theological Appropriation by Contemporary Cosmology

Contemporary cosmology provides great opportunities as well as challenges for a theological appropriation of modern science. We shall first elaborate some of the contemporary attempts to elaborate the theistic implications of contemporary cosmology, and propose that we need a prophetic or critical appropriation of the findings of contemporary cosmology.

3.1. Contemporary Scientists and the Idea of Creation

One can notice that a debate on the theistic implications of the Big Bang. One can trace active appreciation, passive indifference, as well as straight forward rejection among contemporary scientists. Scientists like Robert Jastrow of NASA's Goddart Institute believes that there is a remarkable concurrence between Scripture and Science. He drives home his point when he says, "Now we see how the astronomical evidence leads to the biblical view of the origination of the world. The details differ but the essential elements in the astronomical and the biblical accounts of Genesis are the same: the chain of events leading to men commenced suddenly and sharply at a definite moment of time, in a flash of light and energy."[40]

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[39] Gribbin, *In Search of a Multiverse*, 152-172.

At the same time, reputed scientists like Steven Weinberg, Stephen Hawking and others opt for an atheistic interpretation of contemporary cosmology. While being respectful of their atheistic views, we can see that they act like whistle blowers and call us for a prophetic appreciation of implications of contemporary cosmology to our faith in the creation of the cosmos. As the Big Bang is a theory of the subsequent development of the cosmos (from Planck's time) and not it absolute origination, any attempt of its hurried appropriation into theology would put the cart before the horse. We can notice a similar reasoning in the caution given by George Lemaitre to Pope Pius XII who was quick to welcome the theological implications of Big Bang.

In view of the same, we can find an abandoning of the temporal beginnings or origination in favour of ontological origin among some of the scientists today. This detemporalization of the understanding of the doctrine of creation in line with absolute dependence or sustaining relation of Friedrich Schleiermacher[41] is popular among contemporary scientist theologians like John Plokinghorne who clearly states that 'creation is concerned with ontological origination, not temporal beginning.' This ontological origination correctly leads to an appropriation of divine immanence as creation. One can find this position in Arthur Peacocke, a scientist theologian from England who seems to end in panentheism. One might look at these above attempts at 'fine tuning' of the doctrine of creation to suit or adjust to some of the implications of contemporary cosmology that try to avoid a cosmic beginning.

At the same time 'fine tuning' of scientific positions to suit one's theological position can also be observed among some of the scientists. Thus for instance, Fred Hoyle worked hard to discredit the Big Bang theory only because it seemed to resemble the creation account of Genesis. The same appears to be the motivation of Stephen Hawking and many others who seem to opt for alternative cosmological theories not involving a cosmic beginning.

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[40] Robert Jastrow, *God and the Astronomers*, New York: W.W. Norton, 1978, 14.

[41] Friendrich E. D. Schleiermacher, *The Christian Faith*, vol. I, trans. Richard N. Niebuhr, New York: Harper and Row, 1963, 148-152.

3.2. Assimilation of Theology in Science

The astronomer Jatstrow seems to suggest that with scientific discoveries which led to the Big Bang theory was like climbing the same peak as theology. Apparently this feeling is reinforced mainly by the quantum cosmologies that seem to speak of creation out of nothing. The transformation of matter out of pure energy that resulted from the matter/anti-matter imbalance in the Big Bang is seen as creation out of nothing by many scientists. The end result of this annihilation was production of photons (the remnant which is still detectable as the universal background radiation discovered by Arno Penzias and Robert Wilson in 1965). The remaining matter particles were left to develop into protons, neutrons and eventually into atoms and galaxies and planets. Hawking holds that in quantum theory, particles can be created out of energy in the form of particle and anti-particle pairs. But the question is: From where did the energy come? Hawking suggests that the positive and negative energy balance means the total energy of the universe is zero. If from this mathematical zero energy matter and anti-matter particles were created yet this is hardly what we mean by *Creatio ex Nihilo*.[42]

The linguistic blur achieved through the borrowing of theological terminology into cosmology has allowed scientists to understand the early universe but at a cost. The meaning of the theological term, ‘creation out of nothing’ changes because in quantum physics ‘nothing’ does not mean ‘no thing’. Hence, the reintroduction of the notion that is burnt in the furnace of science into theology requires critical examination as there can be a loss of its original meaning. Hence, contrary to the claim of some scientists modern science has not yet discovered creation out of nothing as the array of laws, principles and quantum fluctuations requires explanation. But this does not mean that contemporary cosmology has nothing to offer to the doctrine of ‘creation out of nothing’. This means that the classical doctrine of creation out of nothing has become scientifically intelligible. But the scientific model of creation out of nothing has been used as arguments against the existence of God. It is precisely such a cosmology that prompted Hawking to ask the now famous question ‘What place, then, for a creator. It seems to bring home the proverbial Pierre-Simon de Laplace’s response to Emperor Napoleon’s query about the absence of God in his system of the world: ‘I have no need of that hypothesis’!?

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[42] Worthing, *God, Creation and Contemporary Physics*, 95-97.

3.3. Science Becoming Theology

One can find a kind of usurpation of the role of theology in the work of some scientists. The physicist Tipler, for instance, regards that physics is too considered as theology. He thinks that physics and theology can reach similar conclusions. This view somehow challenges the interpretive authority of theology. Theology had the privilege of providing the interpretive matrix in the context of science and theology dialogue. But this reduction of theology to physics somehow annihilates the autonomy of theology and permits its unscrupulous absorption into science.

John Barrow and Tipler, in their book, *The Anthropic Cosmological Principle*, drive home the point that the values of a large number of fundamental cosmic constants lie within an extremely narrow range – the only range that would allow for the emergence of life. The observation of the apriori improbability that all the fundamental constants may line up to give us a universe with intelligent life is called the weak anthropic principle. The strong anthropic principle advocated by Barrow and Tipler teaches that our presence in the universe constrains the evolutionary past of the universe. Thus, using the interpretation of quantum theory such as 'quantum observer-created reality', our presence in the universe is thought to be essential for its evolution.[43] In his book, *The Physics of Immortality*, he pursues an ambitious goal that strives to extrapolate the anthropic principle to the final days of the cosmos, and arrives at an eschatology that he interprets as what Christians mean by the resurrection of the dead in the final singularity (Big Crunch).[44] Tripler presents this moment as the omega point, resurrection or fuller manifestation of God.[45]

This project of the reduction of theology to physics has not won much acceptance in the scientific community. Although his Future God Hypothesis sounds radical, it has very few takers. One does science first and then allows theologians to theologize based on its empirical findings. This innovation of putting the cart before the horse at best amounts to a free flight of imagination and is presumably against the very spirit of science.

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[43] John Barrow and Frank Tipler, *The Anthropic Cosmological Principle*, New York: Oxford University Press, 1986.

[44] Frank Tipler, *The Physics of Immortality: Modern Cosmology, God and the Resurrection of the Dead*, New York: Doubleday, 1994.

[45] Frank Tipler, "The Omega Point Theory: A Model of an Evolving God" in Robert. J. Russell, William R. Stoeger, and George V. Coyne, *Physics, Philosophy and Theology a Common Quest for Understanding*, Vatican: Vatican Observatory, 1988, 313-331.

4.1. Prophetic Acceptance of Contemporary Cosmology

4.1.1. Building Cognitive Consonance

Some scientists hold the religious neutrality of contemporary cosmology. Ian Barbour, a scientist theologian, calls us to be cautious about relating t=0 to God. He teaches that it sounds too much like the God of the Gaps. But there is no doubt that cosmological models are relevant to theology. Ted Peter, a contemporary theologian, evolved in the science faith dialogue says that we must work for cognitive consonance through a fruitful conversation between Science and Christianity. Hence, the principle of caution calls for a critical and prophetic appropriation of contemporary cosmology by our theology. This means that we have to look for cognitive consonance between the doctrine of creation out of nothing and the findings of science. It is not that science will add anything new to the revealed truth about creation but it will illumine it and allow it to shine and assist us to understand its deeper nuances. In this context, we must understand that the familiar terms like 'the beginning of the universe,' 'creation out of nothing,' or simply 'creation,' 'omega point,' 'resurrection,' 'immortality,' and many others are not theory neutral. They are indeed theory laden and therefore provide us with the opportunities to build a consonance by a critical examination of their shifting meaning and along with the continuities of meaning that they bring into our conversation of science and the doctrine of creation. This sensitivity to continuities and discontinuities can be illuminating for both Science and Christianity. Although there are claims about the universality of the belief in creation yet we do not regard Christian doctrine of creation as simply an instance of a single general theory somehow shared by the entire humanity. There is certainly uniqueness in the Christian doctrine of creation and this uniqueness has to be attentively discerned in an active dialogue with science. The trinitarian and salvific foundation, along with *creatio ex nihilo* and *creatio continua* forms the crux of the doctrine of creation. Hence, we need to be sensitive to the epistemologies of ignorance that are operating in our theologizing and practice of science.

4.1.2. Learning from the Epistemologies of Ignorance

It is important to be sensitive to what is known as the epistemology of ignorance.[46] When ignorance operates as knowledge it is disastrous for any society. Today we have a spring time for the research on epistemologies of ignorance especially in feminist science studies, and critical race theories. These studies look at the disparity between knowledge claims of the dominant groups and the relatively scientific and social realities. These studies expose the condition of production and operation of knowledge claims that are often grounded in ignorance and by that very token self-deluding. Such self deluding knowledge claims also gives birth to insider/outsider, centre/margin power relations to privilege some and disadvantage others when faced with opaque minority ways of living and being human. These epistemologies look for a remediation of these power relations through their work.

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[46] Shannon Sullivan and Nancy Tuana, *Race and Epistemologies of Ignorance*, Albany: State University of New York Press, 2007.

It is obvious that epistemologies of ignorance have been part of Science-Christianity relationship down the ages. This dynamic dialogue can be seen especially in its phases of conflict as moved by the politics of epistemologies of ignorance. One might think that it was an epistemology of ignorance that led us to condemn Galileo and also to question Darwinism. In this context it would be appropriate to clarify that when we use the term epistemologies of ignorance we use it to mean a condition where ignorance begins to take the place of knowledge. Hence, in our dialogue with contemporary cosmology we need to be critical enough to separate true science that is based on empirical evidence and speculation that is striving to acquire the status of knowledge. No thought that scientific hypothesis or speculation like any other knowledge quest is based on an epistemology of ignorance. That is, we depend on the background that shapes as a supporting outline and framework that we are ignorant about (cannot explicitly know). But what the epistemologies of ignorance that we have tried to evoke here is a narrow concept that considers ignorance as knowledge. One can also notice a similar operation of epistemologies of ignorance among creationists who assign a value of science to their biblical literalism.

4.1.3. Revelation as Axis of Appropriation of Contemporary Cosmology

Contemporary cosmology has changed the worldview of humanity. Unfortunately theologians are slow to comprehend the depth of the transformation it has unleashed. But a reception of contemporary cosmology has to be guided by Revelation. The normativity of Revelation is the guiding principle for any osmosis of Science with Catholicism. Hence, the compatibility of science with the deposit of faith becomes the hermeneutical meeting ground of science and catholic faith.

In this context the role of the magisterium becomes important. It is for the magisterium to indicate which presuppositions, views and interpretations of science are not compatible with the revealed truth. The discernment of the magisterium limits only to those cases that are not compatible with the revealed truths leaving ample space for us to explore possibilities to bring about a fruitful integration of science with our catholic faith. The Church has achieved a great appropriation of Aristotelian science through the work of the angelic doctor St. Thomas Aquinas. In the light of this new development in science it is for us to work for a new appropriation of the findings of science by our theology.

4.2. Theologizing in the Light of Contemporary Cosmology

4.2.1. Natural Theology and Contemporary Cosmology

Most cultures accept that Nature mirrors the divine, and that humans have a natural ability to decode it. This is perhaps the reason why it is held that belief in creation is universal. This means that humanity all over the world throughout history has held some kind of belief about the origin and nature of the universe. This suggests that humanity believed in a meaningful universe, and God was somehow a central coordinate of the meaning of the universe. Some people even believed that humans are microcosms and as such are capable of reflecting the divine in their nature and life.

The catholic faith accepts this ability of human beings to contemplate the truth on the wings of reason as a divine gift. It is through this *diakonia of truth* that we join humanity's struggle to arrive at truth. Along with philosophy, science reflects this human solidarity in its quest for truth. Hence our *diakonia of truth* leads us to appreciate and promote science as it has the power to illumine the truth about us, our Cosmos, and our God.

Contemporary cosmology also reveals the faces of God, Cosmos and Humanity. The evolutionary dynamism and the interrelatedness of the Cosmos makes a paradigm shift and de-centres both a spectator God and humanity, and manifests the dynamically involving God of love and participatory humanity in the evolutionary drama of the universe.

4.2.2. Response of Faith to Contemporary Cosmology

Christian doctrine of creation is a response of faith. It is not merely an intellectual or even religious position. It has a creedal or confessional form. An attentive scrutiny of this creedal form manifests that it is not something self-evident or a discovery of disinterested reason. 'I believe in God the Father, maker of Heaven and Earth' is the same thing as saying 'I know intuitively' or 'reason shows me that.' This means that the doctrine of creation developed as a response of faith. It was born in dialogue with the biblical faith, in dialogue with the creation claims of its times. The Greeks believed that matter was eternal and inferior to spirit, the Gnostics and the Manichean beliefs considered matter as evil. In contrast to this belief claims, Christian faith in creation became an intellectual breakthrough as it taught that matter is intended and created by God and by that very token good! The creative act was not thought to be arbitrary but was regarded as purposive since it flowed not just from the will but the love of God. We can find here both the Trinitarian as well as salvific foundations of creation. Moreover, it achieves another remarkable breakthrough, though the doctrine of creation out of nothing as it successfully establishes a close relation with God, and not dissolves into God as in the case of pantheism, that is, it achieves a perfect harmony between divine immanence and transcendence. Hence it becomes an imperative for our faith to seek an integration of our creedal faith with the teachings of contemporary science. The Big Bang theory that has been scientifically established by the mainstream scientific community is compatible with the doctrine of creation. Even the other speculative proposals that have not become scientifically established do not rule out a theistic interpretation. Even the most atheistic among them can be deconstructed and rendered open to a theistic interpretation as the matrix from where structures of space time and matter emerged to form a universe or multiverse as some would want us to accept, is open to a theistic interpretation. Hence, these speculative positions are not to be seen as threats to the doctrine of creation.

5. Conclusion

Our pilgrimage into contemporary cosmology demonstrates that humanity has indeed reached a high level in its understanding of the universe. This arrival on the peak of cosmology is regarded as coming on the same peak of theology by scientists like Jastrow. We have tried to maintain a critical distance from this over-enthusiastic approach and propose a rather discerning reception of science that is based on the dual principle that separates science from mere scientific speculation, and one that accepts the primacy of revelation.

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THE INTERFACE OF SCIENCE AND RELIGION
The Ecofeminist Theology of Rosemary Ruether

Dominador Bombongan Jr.[◆]

1. Introduction

In his book, *When Science Meets Religion*, Ian Barbour enumerates four typologies that demonstrate "the ways in which people have related science and religion."[1] The following are the fourfold typology: (1) conflict typology argues that science and religion are two distinct fields that are incompatible and hostile (rhetoric of warfare) with one another. Hence, in this typology, scientific materialism (scientific knowledge alone is true knowledge and matter alone is the fundamental stuff of life) is irreconcilable with biblical literalism (the Word of God alone is the source of inerrant truth since it is God's own words). As a consequence, scientific evolution is considered diametrically opposed to Biblical creation accounts; (2) independence typology holds that science and religion represent two different methods of inquiry, each with its own corresponding language and function in life yet at times they offer complementary views of the world. Both are autonomous field of inquiry and function independently to respond to particular sets of questions in life. For instance, science concerns itself with questions dealing with the "how" of things/what is (manner in which reality came about – e.g., evolution) whereas religion involves itself with questions pertaining to the "why" of things/what ought to be (ultimate meanings in life – why are we here,? what is the purpose of our life?); (3) dialogue typology seeks a conversation between science and religion on the level of methods, concepts and limit-questions. There is a possible avenue for dialogue for science and religion, it claims. For instance, on the level of methods, science (scientific data) and religion (religious experience) hold that knowledge is value-laden. Another avenue of dialogue is using similar themes to theorize on both fields such as the theme of communication. This theme can be theorized on both fields analogically. Science speaks of

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[◆] **Dr. Dominador Bombongan Jr.** is an Associate Professor of De La Salle University, Manila. He obtained his licentiate and doctorate in theology from Katholieke Universitiet Te Leuven, Belgium.

[1] Ian Barbour, *When Science Meets Religion*, San Francisco: Harper Collins, 2000, 1.

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DNA as codes of information/communication in human beings while Christianity speaks of the biblical notion of the Incarnate Word (Logos) as God's communication. Still another possibility for dialogue ensues when "science raises at its boundaries limit questions that it cannot itself answer (for example, Why is the universe orderly and intelligible?)."[2] (4) Integration typology proposes a more extensive and systematic interchange between science and religion. Such integration happens in (1) natural theology (we can find proofs of God's existence in the created world), (2) theology of nature (through the new information and evidences provided for by scientific findings theological concepts are revised or reinterpreted), resulting to a possible (3) systematic integration of both science and religion that will serve as a common basis for reflection (a development of an inclusive metaphysics) in order to have a more holistic and comprehensive reading of reality.

This paper develops the integration typology of Barbour through Rosemary Radford Ruether's ecofeminist theology.[3] It will have three main parts. The first part describes in a general way the essential elements of ecofeminism. The second part, the heart of the paper, indicates the points of contact between science and religion in the context of Ruether's over-all ecofeminist theology. Finally, the third part, re-evaluates the traditional concept of God as a result of insights learned from the dialogue of science and religion.

2. Tenets of Ecofeminism

Ecofeminism looks into the reasons for the interlocking oppression between women and nature. Central to ecofeminism, then, is the "unpacking of the connections between the twin oppressions of women and nature."[4] Karen Warren, an ecofeminist philosopher, provides the essential tenets of ecofeminism:

> As I use the term, eco-feminism is a position based on the following claims: (i) there are important connections between the oppression of women and the oppression of nature; (ii) understanding the nature of these connections is necessary to any adequate understanding of the oppression of women and the oppression of nature; (iii) feminist

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[2] Barbour, *When Science Meets Religion*, 3.

[3] This exposition will depend mainly on the earlier works of Ruether that deal explicitly with her ecofeminist views. This article is expository in nature and not so much a critical assessment of Ruether's claims.

[4] Karen Warren, *Ecological Feminism*, London: Routledge, 1994, 106.

theory and practice must include an ecological perspective; and (iv) solutions to ecological problems must include a feminist perspective.[5]

The ecofeminist project identifies structures, attitudes and situations that justify or sanction these two-fold oppressions. Essential to this task is recognizing the logic of domination that is inherent in an oppressive patriarchal conceptual framework. A conceptual framework is

> a set of basic beliefs, values, attitudes and assumptions which shape and reflect how one views oneself and one's world. It is a socially constructed lens through which we perceive ourselves and others. It is affected by such factors as gender, race, class, age, affectional orientation, nationality, and religious background.[6]

A *conceptual framework* can be oppressive when it supports relationships of domination and subordination. Since patriarchy "explains, justifies and maintains the subordination of women by men,"[7] it is considered an oppressive conceptual framework. A conceptual framework is also oppressive when it aids (1) value-hierarchical thinking (up-down approach); (2) value-dualism (either or thinking, juxtaposition of two disjunct, oppositional and exclusive terms such as culture/nature, male/female, mind/body, science/religion, etc); (3) the logic of domination (a logic that gives the power and legitimation to supposedly superior humans to exploit those who are inferior to them); (4) power-over-conceptions of power (a threat or force, imposition of harms and sanctions, expressions of disapproval or displeasure or restriction of liberties of the inferior by the superior); (5) conceptions of privilege (the notion that those who are superior have special privilege and power over those who are inferior). While ecofeminism relies mainly on a conceptual device for its analysis, this does not mean, however, that the twin oppression of women and nature has no concrete manifestations in structures and attitudes in society. Rosemary Radford Ruether's ecofeminism demonstrates the interplay of the conceptual and the structural elements of ecofeminism. To this point, I now direct my exposition.

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[5] Karen Warren, "Feminism & Ecology: Making Connections," in *Readings in Ecology and Feminist Theology*, eds., Mary Heather MacKinnon and Moni McIntyre, Kansas City: Sheed & Ward, 1987,106.

[6] Karen Warren, "The Power and Promise of Ecological Feminism," in *Readings in Ecology and Feminist Theology*, eds., Mary Heather MacKinnon and Moni McIntyre, Kansas City: Sheed & Ward, 1987, 174.

[7] Warren, "The Power and Promise of Ecological Feminism," 174.

3. Rosemary Radford Ruether's Unitary View of the Cosmos

Ruether's ecofeminism demands a unitary vision of the cosmos. Kathleen Sands has argued that "dualism is perhaps the last word Ruether herself would use to describe her position, since for her that term names the broken symbolic world she wants to mend."[8] For Ruether the crux of the ecological crisis lies in the dualistic view of the world. In fact, her whole theology is geared to a healing of our split world as a result of a dualistic worldview. Hence, she calls for a new consciousness/spirituality wherein healed relations can be established among men and women, humans and the earth, humans and the divine, the divine and the earth.[9]

A major aspect of Ruether's overall theological project is to point out how Christianity had been founded on a dualistic conception of reality. This dualistic way of thinking, she maintains, had been assimilated into Christianity through its encounter with the Hebraic and Greek cultures. Specifically, this is seen in Christianity's fling with the Greek (Platonic) dualism that divides reality into mind (higher and superior) and body (lower and inferior) and the Jewish apocalypticism that expects the destruction of the world for a new age to come.[10] The convergence of these different worldviews resulted into a creation of Christianity that is not only dualistic but also patriarchal. Moreover, the combination of these body/world-negating religious traditions in late antiquity bequeathed to Christianity an unfortunate legacy of dualisms: mind/body, intellect/emotion, spirit/matter, culture/nature, and male/female,[11] perhaps even science/religion. This is to say that Christianity has become an instrument in legitimizing not only the marginalization of women but also has generated negative attitudes towards anything that had been associated with the body (e.g., women, blacks, nature).

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[8] Kathleen Sand, *Escape from Paradise: Evil and Tragedy in Feminist Theology*, Minneapolis: Fortress Press, 1994, 89.

[9] Rosemary Radford Ruether, *Gaia and God: An Ecofeminist Theology of Earth Healing*, San Francisco: Harper and Collins, 1992, 4.

[10] Around the second century B.C.E. Ruether claims that there arose a different genre of narrativity of destruction. She calls this narrative apocalyptic. It came about in a period where Israel was experiencing a series of occupation by imperial powers starting with Assyria, Babylonia, Persia, and finally Hellenistic Greece. The Book of Daniel is an example of a Jewish apocalyptic writing found in the Old Testament. Ruether describes apocalyptic literature in the following way: "Israel is envisioned as languishing under a reign of evil brought about by its own sins. God allows the evil nations and demonic powers to triumph over them. In due time, however, God will bring an end to this reign of evil. He will intervene, judge and destroy the wicked nation and vindicate the righteous in a renovated earth, where peace and good times will prevail..." Ruether, *Gaia and God*, 67.

[11] Steven Bouma-Prediger, *The Greening of Theology: The Ecological Models of Rosemary Radford Ruether, Joseph Sittler and Jürgen Moltmann*, Atlanta: Scholars Press, 28.

It is made apparent by Ruether in her exposition in "Gaia and God," that the quest for healed relationships entails a *metanoi* – a conversion to the web of life. According to Ruether the "urgent task of ecological culture is to convert consciousness to the earth, so that we can use our minds to understand the web of life and to live in that web of life as sustainers, rather than destroyers of it."[12] Sifting through the Judaeo-Christian tradition, she advocates two traditions that can help humanity in this healing process – the covenantal and the sacramental/cosmological tradition. The former speaks of God's loving/intimate *involvement* in the history of God's chosen people and the corresponding ethical response, i.e., love, fidelity and justice that must come from them (intimate unity between justice and right relations to nature between God and Israel). Here the Jubilee Year vision of the Old Testament can provide a model for redemptive eco-justice. The latter, brings to attention the existing cosmological/sacramental spirituality in the Christian tradition that has been forgotten. Colossians 1:15-20 is an example of this tradition that needs to be retrieved. Here, Christ is seen as the cosmogonic Logos who creates (immanent divine source) and sustains (ground of creation) but also represents the goal of all things (the source of ultimate redemptive healing). These two "holy voices" must be heard, she intimates, in our search for a truly "biophilic living," i.e., being converted to the matrix of life that nourishes a basic attitude of respect and reverence for the earth.

3.1. Twin Domination of Women and Nature[13]

Early on in her works, Ruether already made a conscious attempt to link the women's movement with the ecological movement in bringing about a radical restructuring of Western society that is premised upon relationships of domination.[14] In my reading of Ruether, I think that what links the twin domination of women and nature is the ideology of transcendent dualism[15] which Christianity had inherited from the Greek culture. In this view, Ruether contends that "we are a dualism of eternal mind and mortal body."[16] This is a way of looking at the world (patriarchal oppressive framework) in an either/or way – male/female, body/soul, culture/nature, etc. It is characteristic of the male ideology of dualism that it cannot enter into reciprocity with the "other".[17] It is said that, since women and nature occupy the "other" in this scheme, this thinking or *logic of domination* in patriarchal Christianity legitimizes the view that women are objects at men's disposal, whereas non-human nature becomes resources for men's exploitation. Ruether contends that, "'headship' of men over women is seen as reflected in the 'headship' of God imaged as a patriarchal male, over creation and the church, imaged as female."[18]

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[12] Ruether, *Gaia and God*, 250.

[13] There have been several senses in which nature is understood in Western thinking: (1) as the essence of a being; (2) the sum total of being which includes physical reality and humans; (3) the sum total of physical reality apart from humans; (4) the "created" world apart from God and the divine grace. In our case, we use the word nature to refer to the non-human nature which is dynamic and has its intrinsic value apart from humans. See Ruether, *Gaia and God*, 5.

[14] Rosemary Radford Ruether, *New Woman New Earth: Sexist Ideologies and Human Liberation*, New York: Seabury Press, 1975, 204.

Ruether believes that transcendent dualism with its "descending levels of rationality and hence of fitness for servility" was appropriated by Christianity in the early centuries and shaped Western culture well into the modern period.[19] Ruether characterizes Augustine's theology as a conservative fusion of Hellenistic Apocalypticism and Platonic dualism. This led Augustine to the view that patriarchy is the natural order of society. In addition, Augustine believed in "the innate inferiority of women, their lack of capacity for headship, their subjugation to the male as the representative of the 'image of God.'"[20]

Transcendent dualism had strongly influenced our practice of asceticism leading consequently to attitudes of hostility towards women, sexuality, the body and had advanced a rather flight-from-the-world spirituality in Christianity. The demonizing of women as witches in the Middle Ages may be traced back to this influence. It may also explain St. Bonaventure's ambivalent attitude to physical nature in his discussions on the different ladder of ascent to God in his ascetic spirituality. For him, the lowest and crudest stage of contemplation, (albeit also leading to God) is contemplating on material nature.[21]

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[15] Ruether, *New Woman New Earth*, 195.

[16] Ruether, *Gaia and God*, 255.

[17] See Ruether, *New Woman New Earth*, 195.

[18] Rosemary Radford Ruether, "The Development of My Theology," *Religious Studies Review* 15, 1 (January 1989), 3.

[19] See Ruether, *Gaia and God*, 184.

[20] Ruether, *Gaia and God*, 186.

[21] Cited in Ruether, *Gaia and God*, 190.

A transcendent dualistic worldview has also its ramifications in the Christian view of sin and evil. In "Gaia and God," Ruether demonstrates how the Christian view of sin has been influenced by the Jewish (sin as historical) and Greek (sin as metaphysical) views.[22] As a result, in Christianity sin has been seen as that which we are culpable of but at the same time something that we are incapable of overcoming. "The notion that humanity is culpable for its own finitude has laid upon Christians an untenable burden of guilt. Although we may evaluate our mortality as tragic, or seek it as natural, what mortality is not is sin, or the fruit of sin."[23] Sin, she argues, has to do with injustice (broken, oppressive relationships) fostering socio-economic-political injustice as well as the destruction of nature.

Ruether maintains that the Calvanist Reformation (with its demonic view of nature and women, iconoclastic attitude to visual arts in churches, support for patriarchal family as key institution for church and family) and the Scientific Revolution (matter is for scientific and technological control) of the 16th and 17th century further aggravated the negative views on women and nature.

According to Ruether, it is the common opinion in "Western intellectual history that one of the major factors in dispelling the kind of 'superstitious' views of nature that promoted the persecution of witches was the rise of sciences in the seventeenth century."[24] In the name of modern rationality witchcraft had to be terminated. However, she notes that, "this obsession with woman as witch was by no means confined to the Middle Ages or to Catholicism, but would be continued in Protestantism and provide major metaphors, both for early scientific investigation of nature and also European colonization of 'pagan' lands.[25]

Ruether observes this with respect to Francis Bacon (1561-1626) who is considered the father of the scientific method. In his *Novum Organum* (1960), Bacon allegedly described the scientific laboratory in a language taken from the Inquisitor's chamber, in which nature is "vexed" and put to the test and thereby "forced to yield her secrets." Ruether insists that this similarity of language should not be taken as a mere coincidence. She further notes that Bacon's works are replete with terms/images (coerced, penetrate, conquered) that show language of violence against women and nature. Bacon seems to have connected science with the Christian story of the fall and redemption. For Bacon, science will bring about redemption to the fallen world by subjecting it to its scrutiny and control in order to induce its fruition (progress).

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[22] For the Hebraic tradition, sin lies with the will to disobey God's covenantal commandment of justice. For the Greek tradition, however, sin is the soul's losing sight of the eternal essences thereby producing the body. See Ruether, *Gaia and God*, Chapter III.

[23] Ruether, *Gaia and God*, 141.

[24] Ruether, *Gaia and God*, 194.

[25] Ruether, *Gaia and God*, 190.

René Descartes (1595-1650) has also contributed to the idea of physical nature as an object of scrutiny. Ruether claims in "Gaia and God" that Descartes is the originator of the use of the metaphor of a machine to describe material nature. "The result is a radical denial that material reality itself is capable of producing reason or any innate animation."[26] Descartes is also said to have reduced animals to "automata," i.e., mechanically powered life forms (just like clocks!). This gave justification for the use of animals for experimentation. Scientists were trained to think that it is okay to make use of them for experiments because they lack souls or feelings.

Ruether sees Isaac Newton (1642-1727) as the one who ultimately laid the foundations for a mechanistic worldview. This worldview exorcised the spirits (whether good or bad) that were believed to have resided in the world in the older worldview. Nature is left passive, static, malleable and neutral – to be used as resources. This mechanistic worldview gave the impetus to the ruling class of Europe to appropriate the world as a resource to build their power and wealth on. Ruether posits that this worldview led to the rise of colonization and all the evil things that are associated with it.

3.2. Understanding the Conceptual Connections

From the above discussions, we can conclude that the ideology of transcendent dualism has related "sexism and ecological destruction in the symbolic patterns of patriarchal consciousness."[27] In other words, in patriarchal Christianity, sexism and naturism are connected *conceptually* and is also manifested concretely in the ambivalent attitude of the church toward women and physical nature. Hence, Ruether strongly holds that "we cannot criticize the hierarchy of male over female without ultimately criticizing and overcoming the hierarchy of humans over nature."[28] This is the reason Ruether proposes a reconstruction of theology that is free from dominating and hierarchical relations. Crucial part of this reconstruction of theology is listening to the stories coming from the sciences. This leads us to the heart of this article.

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[26] Ruether, *Gaia and God*, 196.

[27] Ruether, *New Woman New Earth*, 196.

[28] Rosemary Radford Ruether, *Sexism and God-Talk: Toward a Feminist Theology*, Boston: Beacon Press, 1983, 73.

3.3. Feminist Analysis Must Include Scientific/Ecological Insights

Ruether asserts that the rise of the physical and the biological sciences in the 16th and 17th centuries, posed serious challenges to the creation narrative of Christianity.[29] Two crucial events were responsible for dislodging the Genesis One account of creation from the esteemed placed it had occupied for years in society.

One of these events was the shift from a geocentric worldview (Ptolemy) to a heliocentric one (Copernicus). Copernicus (1473-1543) gave the impetus for this shift, but it was Galileo (1564-1642) who "popularized" this worldview. Ruether notes that the Catholic Church engaged herself in a fierce battle against this view which eventually led her to condemn Galileo. As Ruether clearly explains, the whole shift of worldview "destroyed a whole moral and spiritual system"[30] in which important claims of Christianity during those times were anchored.

A second event that threatened the adequacy and veracity of the church's view on creation happened in the publication of Darwin's *On the Origin of Species* (1859) and *The Descent of Man* (1871). These books contained the evolutionary view of Darwin. Darwin's view undermined presumably the Christian belief that humans were created separately from the rest of creation (as crown of creation). Rather, it held the view that humans, animals and plants evolved one from the other through a long process of mutation. Human beings, then, are seen to have evolved from apes. This thinking puts seriously into question the whole notion of human consciousness (immortal soul) in Christianity that placed humans above animals. Furthermore, it gravely weakened the Christian belief that creation happened in six days.

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[29] Ruether holds that creation stories are blue prints of societies, for they validate the particular worldview of a culture and legitimize its continued existence. Christianity for its part has canonized the Genesis One account in the Hebrew Bible (OT) as its official accepted creation narrative. Ruether posits that this Hebrew creation account was a product of various creation stories which themselves reflect varying worldviews. For example, the Hebrew account of creation was influenced by earlier Babylonian creation stories, notably the *Enuma Elish*. Moreover, the Genesis One account, Ruether claims, has been read through the eyes of Greek science of the sort reflected in Plato's *Timeaus*. In short, Western Christianity has been synthesizing different worldviews (Eastern, Hebrew, and Greek) and incorporating them into its own. As a result, Christianity reads the Hebraic account of creation differently. Put in a slightly different way, Christianity's understanding of the Hebraic account contains "foreign" ideas which strictly speaking were not to be found in the Hebrew worldview. This "different reading" accounts for certain ambiguities in Christianity vis-á-vis the God-cosmos relations. See Ruether, *Gaia and God*, 17-31.

[30] Ruether, *Gaia and God*, 33.

These developments, Ruether maintains, resulted into a situation where science and religion were not in good speaking terms with one another anymore. This was highly reinforced by the Baconian scientific method of the split between the realm of the objective/scientific and the realm of subjective/religious. For years, this had been a convenient arrangement for both parties, until recently.

Ruether has noticed that the "cold war" or mutual insulation that existed for a long time between Christianity and science is beginning to crumble down. There are several factors to this. One is the growing realization that the "progress" which science had triumphalistically announced has not been achieved yet. Instead, this so-called progress brought about societal and environmental crises. Ruether claims that present day thinking has also begun to link the idea of progress to moral responsibility. Moreover, science seemingly does not satisfy fully human search for the ethical, aesthetic and the spiritual.

Another important change that signalled this emerging dialogue is the serious challenge put on the mechanistic/atomistic view of Newtonian physics. For Newton, an object remains inert as long as there is no object that makes it move. This implies a static, fixed framework of space and time. With the advent of the theory of relativity of Einstein and quantum physics, this static, objective worldview of Newton was seriously challenged. Quantum physics discovered that matter is not static but "fluid" like a light. This view resulted in the claim that the subatomic particles are undergoing a "dance" (energy fields). These minute particles are engaged in continuous interactions with those environments they were related to. These particles merged and coalesced with one another. Clear-cut distinctions among them became fluid. Ruether cites Fritjof Capra (1977) as an example of a thinker who tries to bridge the gap between science and religion. Presumably, Capra sees some common features between the new discoveries in the new physics (concept of dance of energy) and the traditional mysticism of Buddhism and Taoism.

With the new discoveries in quantum physics, what Ruether wishes to emphasize is the fact that they raise serious challenges to a dualistic mentality. In quantum physics, mutual relationality among subatomic elements is emphasized. Ruether referring to the importance of the new physics expresses the following words:

> With this merger of the two opposite poles of Classical Greek ontological dualism, spirit and matter, it was even less appropriate to continue to make a dualistic opposition between objective and subjective, fact and value. It became necessary to recognize that the world not only appears differently according to our standpoint toward it and methods of addressing it, but itself will be constituted differently by the stance assumed toward it. Rather than assuming a standpoint outside of and unrelated to reality, from which "objective" knowledge is possible, the observer is an integral part of the reality observed.[31]

The emphasis on mutual relationality is further developed in her ecofeminist theocosmology. Drawing from this scientific insight and combining it with that of Teilhard de Chardin and process theology, Ruether stresses the "coincidence of opposites." Subatomic particles are imbued with a "rationality." This "rationality" drives these minute particles to move into novel patterns to form higher stages of matter. This "concentrated" matter which also is involved in the dance of energy dissolves, further, into a wider web of relationship with others. So the process goes on and on until finally reality is able to reach its goal – the coming together of matter (dissolution into the many) and Spirit (the unifying whole). She argues:

> This matrix of dancing energy operates with a "rationality," predictable patterns that result in fixed number of possibilities. Thus what we have traditionally called "God," the "mind," or rational pattern holding all things together, and what we have called "matter," the "ground" of physical objects, come together. The disintegration of the many into infinitely small "bits," and the One, or unifying whole that connects all things together, coincide.[32]

The astrophysical sciences have their own story to tell too. Their story of creation begins with the "Big Bang." 15 billion years ago, scientists have imagined a moment in time where there was an intense concentration of matter-energy into a single ball. This single ball of energy was so charged that suddenly it exploded, thereby producing/creating energy and matter (space and time) in the universe. For hundreds of years, these spaces where inhabited only by atomic structures and gasses which gave rise to the formation of galaxies – and thus the Solar System with its sun and planets.

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[31] Ruether, *Gaia and God*, 39.

[32] Ruether, *Gaia and God*, 249.

Life seems to have begun on the earth nearly 4.5 billion years ago. According to scientists, life seems to have started in the seas in the form of photosynthesizing bacteria that later developed into aquatic animals and plants. Later on, other forms of life begun to emerge on the land too. Ruether stresses that in this biological story, human beings came very late. "Within that history of land animals, humans occupy a fraction of time, a mere 400, 000 years, or less than one-tenth of 1 percent of earth's history".[33] Apparently, animal kingdoms and ecosystems have been existing for a long time without humans. Ruether notes, however, that in the very short history of human beings on earth, human population has grown in an amazingly rapid way. This growing population also corresponded to an accelerating human colonization of the earth. In Ruether's opinion, the fact that "humans are mere latecomers on earth" is a reason enough to generate feelings of respect and a sense of reverence for the whole cosmos.

3.4. Lessons from the Ecological Science

Ruether defines ecology as the biological science that studies the laws of how biotic communities, unaided by humans, generate and sustain life.[34] It also provides guidelines on how human beings can learn to be sustaining rather than destructive of their environment.

According to Ruether, there are important insights that we can learn from the way nature works. First and foremost of this is the interrelation of all things. Humans share a deep kinship with the whole of reality – from galaxies and stars (stars were the sources of planets of which earth is one of these planets) to the smallest bacteria (remember the photosynthesizing bacteria as the beginning of life) on earth. Ruether holds that a realization of our deep kinship with the whole of the cosmic reality can demolish the arrogance of human beings towards what humans consider lower forms of life. "Recognition of this profound kinship must bridge the arrogant barriers that humans have erected to wall themselves off, not only from other sentient animals, but also from simpler animals, plants, and the abiotic matrix of life in rocks and soils, air, and water."[35]

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[33] Ruether, *Gaia and God*, 45.

[34] Ruether, *Gaia and God*, 47.

[35] Ruether, *Gaia and God*, 47.

Another important message one draws from ecological studies is the insight that plants, air, water and animals coevolved. This means to say that life continues to go on because of the symbiotic relationships among these factors in the universe. The food-chain, the cycle of production, consumption and decomposition in nature are evidence of the interdependency, cooperation that is present in our ecosystems. Related to this insight, is the fact that, nature appreciates diversity. Diversity is needed to sustain the ecosystems. Amidst the diversity in nature, the law that prevails is cooperation (among species or sub-species; for the rest they devour each other) and not so much about competition. Ruether alludes here to the false picture that the Darwinian evolutionary slogan of the "survival of the fittest" gives. It gives the impression that only the rich, strong and the powerful have the right to exist.

These are some of the insights she acquired from the sciences. Through them, Ruether became aware of the need to conceive new creation stories/narratives. She suggests that "[w]e need scientist-poets who can retell ... the story of the cosmos and the earth's history, in a way that can call us to wonder, to reverence for life, and to the vision of humanity living in community with all its sister and brother beings."[36] In these new stories, Ruether wishes to emphasize relationality, solidarity, mutuality, integrity, justice and responsibility. Moreover, they should recapture the "thou-ness" of the whole of reality. In addition, they have to emphasize the important role humans play because of their gift of reflective consciousness. They are to be stewards of the whole of cosmic reality. So, Ruether pleads: "Human consciousness, then, should not be what utterly separates us from the rest of 'nature.' Rather, consciousness is where this dance of energy organizes itself in increasing unified ways, until it reflects back on itself in self-awareness. Consciousness is and must be where we recognize our kinship with all other beings."[37] Learning from the stories of the quantum physics, astrophysics, biological sciences and the science of ecology, a genuine spirituality of creation and non-oppressive relationships can ensue.

3.5. Ecological Thinking Needs the Insights of Feminism

The ecological insights from the sciences are further enriched by a feminist perspective. One of the basic tenets of ecofeminism is the claim that ecological movements or thinking must embrace a feminist perspective. We see this present in Ruether's discussion of sexism as a distortion of relationship between males and females. She identifies sexism as the most virulent form of sin or broken relationship. It represents the "psychic-model" for the other forms of oppression. She maintains:

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[36] Ruether, *Gaia and God*, 58.

[37] Ruether, *Gaia and God*, 250.

> Sexual symbolism is foundational to the perception of order and relationship that has been built up in cultures. The psychic organization of consciousness, the dualistic view of the self and the world, the hierarchical concept of society, the relation of humanity and nature, and of God and creation – all these relationships have been modeled on sexual dualism. Therefore the liberation of women attacks the basic stereotypes of authority, identity and the structural relations of 'reality.[38]

Any authentic environmental ethics and spirituality will have to take into consideration this insight. If sexual dualism forms the model for all other forms of oppressions, then the dynamics of sexism will be a crucial basis in trying to explain and combat naturism and other forms of oppressions. This implies the coordinated effort to root out different forms of oppressions. The call for all is to foster non-exploitative and non-dominating relationships.

4. The Male Monotheistic God: Toward a Reinterpretation

The insights from the sciences, ecological studies and feminism direct Ruether to a re-evaluation of traditional theological concepts. As indicated by Bouma-Prediger "Ruether's entire discussion of ecojustice leads ultimately to the conclusion that some radical theological reconstruction is needed. Perhaps most especially, there is a need for a reconception of God."[39]

4.1. Male Monotheism: Legitimator of Transcendent Dualism

Ruether maintains that the image of a male monotheistic God religiously legitimizes the social hierarchy of patriarchy and the hierarchical structuring of reality – God-male-female-nature through the practice of domination. Ruether elucidates her point:

> ... the idea of the male monotheistic God and the relation of this God to the Cosmos as its Creator, have reinforced symbolically the relations of domination of men over women, masters over slaves, and (male ruling class) humans over animals and over the earth. Domination of women has provided a key link, both socially and

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[38] Ruether, *New Woman New Earth*, 3-4.

[39] Bouma-Prediger, *The Greening of Theology*, 51.

> symbolically, to the domination of earth, hence the tendency in patriarchal cultures to link women with earth, matter, and nature, while identifying males with sky, intellect, and transcendent spirit.[40]

This hierarchical order, contends Ruether, is evident in both the Old and New Testaments. In the Old Testament, this is seen in the patriarchal system where women, children and servants are defined in reference to the patriarchs who "own" them. Ruether cites 1 Corinthians 11:3,7 as an example in the New Testament where this hierarchical "order" is also mandated.[41] Furthermore, the image of a male monotheistic God results in a dualistic conception of reality. In the ancient myths, however, the Gods and Goddesses sprung from the matrix of one physical-spiritual reality. In contrast, in male monotheism, nature is no longer the matrix where the gods and humans come to being. A male monotheistic God is seen to exist above his creation and is responsible for calling forth this creation in existence. A rapture in reality, therefore, is created – the transcendent Spirit (Male God) and the inferior and dependent physical nature (creation). In this scheme of perceiving reality, man becomes essentially the image of the male God, while women and physical nature become the images of material reality. Therefore, "the woman, the body and the world [plants, rocks, stars, etc.] were the lower half of a dualism that must be declared posterior to, created by, subject to, and ultimately alien to the nature of (male) consciousness, in whose image man made his God."[42]

4.2 God/dess: The Divine as both Transcendent and Immanent

According to Ruether, the patriarchal Christian tradition has emphasized so much the transcendence of the divine (God "up there" above the sub-lunar spheres sealed from any tinge of materiality), at the expense of the divine's immanence. She, therefore, stresses the need to recover the immanence of the divine.[43] Her best attempt to recover the divine's immanence is through her concept of God/dess as the Primal matrix.

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[40] Ruether, *Gaia and God*, 3.

[41] "But I want to understand that the head of every man is Christ, the head of a woman is her husband, and the head of Christ is God... For a man ought not to cover his head, since he is the image and glory of God, but the woman is the glory of man" (1 Corinthians 11:3,7 NRSV).

[42] Ruether, *New Woman, New Earth*, 195.

[43] It must be noted that Ruether does not only show us how God-talk has legitimized women's and nature's oppression. But she is also interested in finding an answer to the classic Christian question regarding God's transcendence and immanence.

> We can speak of the root of human image of the divine as the Primal Matrix, the great womb within which all things, Gods, and humans, sky and earth, human and nonhuman beings, are generated. Here the divine is not abstracted into some other world beyond this earth but is the encompassing source of new life that surrounds the present world and assures its continuance.[44]

What this root image conjures about the Divine is that God is not only the source of life (Creator) but also is the one who continues to sustain and nourish the whole of the created world. It also speaks of the fact that because the whole of creation comes from the cosmic womb, then it shares the same "material stuff", so to speak, as that of the Primal Matrix. Here then, the traditional theological expression – "created in the image and likeness of God" gains a deeper meaning. It no longer speaks only about a spiritual journey to holiness or simply expresses the divine spark in us but it articulates the lofty and the real condition of the created world- that is, it shares the same substance as that that of the Divine Creator and thus worthy of dignity and respect. Hence, the Primal Matrix is the most appropriate way of expressing both the transcendence and immanence of the divine. It rejects the dualism of matter and spirit. So, Ruether writes:

> It [image of God as Primal Matrix] must reject both sides of the dualism: both of the image of mother-matter-matrix as 'static immanence' and as the ontological foundation of existing, oppressive social systems and also the concept of spirit and transcendence as rootless, antinatural, originating in an "other world" beyond the cosmos, ever repudiating and fleeing from nature, body and the visible way.[45]

This insight is important, according to her, if there is ever to be an authentic liberation for women and nature from exploitation. In this line of thought, liberation will not be conceived as "out of or against nature [immanence] into spirit [transcendence],"[46] but back into a proper relationship with nature (healing broken relationship with other people and with nature).

The God/dess concept, therefore, is not the divine that sanctions patriarchal hierarchy and oppressive relationships in society. Rather, God/dess liberates people from oppressive forces while leading them to new possibilities (transcendence). In doing so, it regrounds people in the world (nature). The God/dess is the one who embraces the material subtratum of our existence. God as a Primal Matrix (cosmic womb) is merged with the creative processes of the world. Ruether avers:

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[44] Ruether, *Sexism and God-Talk*, 48.

[45] Ruether, *Sexism and God-Talk*, 70.

[46] Ruether, *Sexism and God-Talk*, 70.

> God/dess who is the foundation (at one and the same time) of our being and our new being embraces both the roots of the material substratum of our existence (matter) and also the endlessly new creative potential (spirit). The God/dess who is the foundation of our being-new being does not lead us back to a stifled, dependent self or uproot us in a spirit-trip outside the earth. Rather it leads us to the converted center, the harmonization of self and body, self and other, self and world. It is the Shalom of our being.[47]

Clearly, Ruether reinterprets the meaning of God's transcendence and immanence. On the one hand, by God's transcendence, she means, that God is the well-spring of new potentialities for creation. On the other hand, by God's immanence, she implies that God is the anchor, as well as, the source of our very being as creatures.

To conclude this section, I present here the challenge posed by Ruether's ecofeminist theology:

> An ecological-feminist theology of nature must rethink the whole Western theological tradition of the hierarchical chain of being and chain of command. This theology must question the hierarchy of human over nonhuman nature as a relationship of ontological and moral value. It must challenge the right of the human to treat the nonhuman as private property and material wealth to be exploited. It must unmask the structures of social domination, male over female, owner over worker that mediate this domination of nonhuman nature. Finally, it must question the model of hierarchy that starts with nonmaterial spirit (God) as the source of the chain of being and continues down to nonspiritual 'matter' as the bottom of the chain of being and the most inferior, valueless, and dominated point in the chain of command.[48]

In short, the chain of being, which emanated from an immaterial God – the immaterial One spreading into multiplicity (Nous, Psyche) to reach the realm of matter – is at the same time the chain of command and grounds the level of ontological difference among the realities in the chain of being. If Immaterial God occupies the highest level, the material world represents the most devalued level. Ruether propounds that this scheme of thinking has generated hierarchical oppressive relationships in society particularly in

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[47] Ruether, *Sexism and God-Talk*, 71.

[48] Ibid., 85.

Christianity. Ruether's ecofeminism seeks, then, the eradication of such oppressive schemes of relationships that have plagued Christianity. Ruether's ecofeminism acknowledges the twin domination of women and nature. It insists on the significance of solving sexism and naturism within her vision of eco-justice. It relies not only on retrieving important biblical traditions but also depends on the ecological movements and the new physics. Finally, it seeks to demolish a hierarchical (Immaterial God *vs.* material beings) and dualistic conception of reality (spirit/matter).

5. Conclusion

A constructive dialogue between science and religion is indispensable especially in a world wrecked by the relentless disrespect for women and nature. These dual oppressions of women and nature have already taken a global scale such that they demand not only a personal or local response but also a global one. Independently from each other, neither science nor religion can claim that it has all the answers to these problems. Such fundamentalist tendencies or exclusive claims on both sides will only contribute to the worsening of the problem because of myopic and isolated responses, not to mention the general feeling of apathy it can generate. Thus, a concerted effort between science and religion to address sexism and the ecological crisis is urgently needed. If we have to make a new story of hope in our ravaged globalized village, it has to come from the wellsprings of religion and science. Each in respectful and constructive dialogue can share from its own competencies in coming up with a more comprehensive solution to our present daunting predicaments.

Let me summarize the major insights put forward in this exposition:

1. Using the integrative typology of Ian Barbour I have demonstrated how theology of nature in general and the ecofeminist theology of Ruether in particular have fostered a meaningful dialogue between science and religion.
2. Ecofeminist philosophy/theology examines critically the interlocking oppression between women and nature through the notions of oppressive conceptual framework and the logic of domination.
3. Ecofeminism advocates that for feminist theory and practice to be a powerful tool of analysis, it must include scientific/ecological perspectives. Solution to ecological problems must include a feminist perspective because sexism represents the "psychic-model" for all other forms of oppression.

4. Rosemary Radford Ruether's ecofeminism blames the ideology of transcendent dualism in Christianity as the reason for sexism and ecological disrespect. This ideology, supported by the image of a male monotheistic God, legitimizes patriarchy and the hierarchical structuring of reality where women and nature occupy the lowest rank. For her, to bring about a transformative praxis in our treatment of women and nature, there is a need to deconstruct prevailing sexist and anti-nature Christian narratives.
5. Ruether promotes the reconstruction of new creation stories/narratives that draws out from the well-spring of scientific discoveries. In these new stories, she hopes to recapture the "thou-ness" of the whole of reality and to emphasize the important role humans play because of their gift of reflective consciousness.

The task ahead in the reconstruction of theology and philosophy into a more gender and environmentally sensitive disciplines is first to have a robust awareness and understanding of the real pains and groaning of women and nature. Critical awareness of these issues will make us mindful of the kinds of ideas and values that we advocate so that they lead to the promotion of a more equitable and humane forms of relationships rather than oppressive and exploitative ones. That our changed perspectives and renewed relationships with women will take on a more just pattern of exchange. And that our restored connection with nature shall bring forth the flourishing of life and the protection of the delicate balance of our environment. In this reconstruction process, science is our natural ally.

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THE GOD OF THE GAPS

Dennis Vanden Auweele[◆]

1. Introduction

Our present age has, especially in the West, an explosion of publications by scholars of various backgrounds, each in their own way, propagating some form of atheism. Some of the more outspoken among these are Daniel Dennett,[1] Richard Dawkins,[2] Christopher Hitchens,[3] Sam Harris,[4] Victor Stenger,[5] David Mills[6] and Gref Graffin.[7] These authors engendered, especially in Northern America, a lively debate on the value, the scientific foundation and the rationality of religion. In the United

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[◆] **Dennis Vanden Auweele** is a doctoral research assistant at the Institute of Philosophy, Catholic University of Leuven. He is currently pursuing his research on the theme of 'Radical Evil' in Modern philosophy with a particular emphasis on the relationship between religion and philosophy under the supervision of Prof. William Desmond. He has lectured and published on the works of Friedrich Nietzsche, Immanuel Kant and the philosophy of religion in general.

[1] Daniel Dennett is a university philosophy professor (Tufts University) and a prominent member of the 'Brights Movement' that tries to promote a purely naturalistic world-view in the United States of America. His publications on this subject include: *Breaking the Spell. Religion as a Natural Phenomenon*, London: Penguin Books, 2006; *Science and Religion*, Oxford: Oxford University Press, 2010.

[2] Richard Dawkins is an evolutionary biologist and a popular science author. Some of his work include: *The Selfish Gene*, Oxford: Oxford University Press, 1976; *The Blind Watchmaker*, New York: Norton and Company, 1986; *The God Delusion*, Boston: Houghton Mifflin, 2006.

[3] Christopher Hitchens is a journalist, columnist and author of *God is not Great: How Religion Poisons* Everything, New York: Warner Books, 2007.

[4] Sam Harris is a neuroscientist and philosopher. His works include: *The End of* Faith, New York: Norton and Company, 2004, *Letter to a Christian Nation*, New York: Knopf, 2006.

[5] Victor Stenger is a physicist and author of *God the Failed Hypothesis: How Science Shows That God Does Not Exist*, New York: Prometheus Books, 2007; *The New Atheism: Taking a Stand for Science and Reason*, New York: Prometheus books, 2009.

[6] David Mills is a popular atheist author; he published, among others *Atheist Universe: The Thinking Person's Answer to Christian Fundamentalism*, Berkeley: Ulysses Press, 2006.

[7] Gref Graffin is an evolutionary biologist and lead singer of the rock band 'Bad Religion.' His recent contribution (co-authored by Steve Olson) to this debate is *Anarchy Evolution: Faith, Science, and Bad Religion in a World without God*, New York: IT Books, 2010.

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Kingdom, the so-called 'Oxford God-Debate' has pitted on the one hand Richard Dawkins and his cohort Peter Atkins and on the other Archbishop Rowan Williams, theologian Alister McGrath and the biochemist/theologian Arthur Peacocke against each other. Recently, these last three have been joined by the theologian and born-again Christian Keith Ward. A staggering amount of works have been published by authors on both sides of the issue in an attempt to defend their respective position from attacks from the opposite side. A certain recurring theme in this discussion is the notion of the 'God of the gaps'. The 'God of the gaps' is a term, usually used in a demeaning fashion, to caricaturize a religious person's claim that those issues that science has not (yet) exhaustively explained must be explained by God. Needless to say, few advocates of a religious life openly defend such a view of God. This approach is mostly linked to American creationism and intelligent design, both of which I would characterize as poor science and even worse religion.[8] The term 'God of the gaps' most likely has its origin in the Lowell Lectures by Henry Drummond on 'The Ascent of Man' (1894) in which he states: "There are reverent minds who ceaselessly scan the fields of Nature and the books of Science in search of gaps – gaps which they will fill up with God. As if God lived in gaps?"[9] The term was popularized and scorned by the theologian Dietrich Bonhoeffer (1944)[10] and his advocate Richard Bube (1971)[11] who believed that any understanding of God as filling gaps of scientific knowledge was most certainly going to lead to the steady recession of divinity as 'gaps' are progressively filled by science over time.

In this paper, I will examine the claims of the 'God of the gaps' notion and offer a critique from a philosophical point of view. The conception of the 'God of the gaps' is mostly held by on the one hand proselyte atheist scientists in a haphazard quest to refute, what they perceive to be, the claims of religion and on the other hand fundamentalist fideistic religious believers who use it to point towards the shortcomings of science and the necessity for a supernatural agent so to account for the intricate complexity of creation. First, I will expand on the notion of the 'God of the gaps' and offer an illustration. Second, I will point to the obvious and less obvious limits of this theory as it focuses on religion and science in a negative sense. Third, I will point towards a different understanding of the relationship between science and religion in a more positive light. Lastly, I will make some comments on the possibility of dialogue between science and religion as we need to move towards a rational faith or faithful rationality.

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[8] The creationist and controversial college professor Michael Behe has defended a view similar to 'God of the gaps' in his: *Darwin's Black Box*, New York: Simon and Schuster, 1996. He points for instance to the 'irreducible complexity' of the bacterial flagellar motor which, in his view, could not be explained by evolution. Shortly after writing his book, however, a number of publications showed that the bacterial flagellar motor could indeed be explained by evolution.

[9] http://henrydrummond.wwwhubs.com/ascent10.htm

[10] Dietrich Bonhoeffer, *Letters and Papers from Prison*, ed. E. Bethge, New York: Simon and Schuster, 1997.

[11] Richard Bube, *The Human Quest: A New Look at Science and the Christian Faith*, Nashville: W Publishing Group, 1971.

2. God of the Gaps: Definition

The notion 'God of the gaps' is usually used in a demeaning fashion to describe a tendency by believers of a certain persuasion to warrant the credibility of their faith by pointing to the fact that science has not explained certain things therefore these gaps require a supernatural explanation. This reasoning puts science and religion into an antagonistic relationship and is, in itself, fundamentally flawed on a logical level: if science has not (yet) explained x, it does not follow that (1) science will not ultimately be able to explain x or that (2) x requires a certain supernatural explanation. Popular gaps are the evolution of the human eye, the rise of (self-)consciousness and the 'creation' of the universe. Science has not yet fully explained and detailed the natural processes pertaining to these; this does not mean, however, that science is fundamentally unable to explain these or that they require a supernatural explanation. Still, those who adhere to creationism or its more moderate sibling intelligent design point[12] towards these 'riddles' in order to make credible their faith in a personal and transcendent (supernatural) God. As a consequence of this, a lot of scientists of an atheist persuasion have turned into crusaders and proselytizers: they attempt to do away with any and all riddles of nature in order to conclusively prove that the religious outlook on life is fundamentally wrong. An astounding number of thinkers, such as Richard

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[12] Creationism entails the belief that the Earth and the rest of the universe are created by a supernatural agent. The term is mostly used in contrast with certain biological understandings of the evolution of man such as Darwin's theory of evolution. Intelligent design is a pseudoscientific offshoot of creationism (akin to 'creation science') that attempts to validate the opinion that certain processes and features of the universe and living things cannot be explained by purely naturalistic means, but require intelligent design.

Dawkins, Victor Stenger and David Mills, utilize science not to attain greater and more knowledge, but rather to defend their naturalistic worldview. Allow me to illustrate this issue by reference to a contemporary phenomenon.

In Cern, Switzerland there is a controversial experiment running at the Large Hadron-collider. At this institute, a number of scientists are attempting to recreate the elemental status of the universe that is presumed at the 'time' of the Big Bang. They attempt to speed up mass to such a velocity so that it approaches the speed of light and turns into pure energy. When this velocity is achieved, it is believed that the Higgs-Boson particle will be created. The existence of this particle needs to be verified in order to fill a certain gap in the standard model for particle physics which would conclusively attest to the veracity of the Big Bang theory. This particle is often referred to as the 'God-particle'[13] because it is claimed to be the last hiding place of God. According to some scientists, proving the veracity of the Big Bang theory will result in demonstrating the inexistence of God and the failure of religion. A number of scientists have openly revolted against this hidden agenda; they prefer to base their research on scientific curiosity rather than it being an attempt to disprove religion. In his column in the London magazine 'The Guardian', journalist and physicist Ian Sample has suggested a contest to rename the 'God-Particle' because it has to him some undesired connotations. A group of physicists have ultimately opted for the name 'The Champagne Bottle Boson.'[14] The research conducted at the Large Hadron Collider and the hidden agenda of some scientists exemplify the drive behind the 'God of the gaps'. Religious people who defend this view tend to point towards some unsolved questions in the area of science to make plausible the claim of the existence of a supernatural entity, while scientists who defend this view tend to utilize this notion in order to be able to conclusively do away with religion as a whole. David Mills puts it as follows: "As a general historical observation, each step forward taken by science has further distanced the hand of God from perceived intervention into natural events. As humanity's gaps of knowledge were slowly replaced by scientific understanding, a 'God of the Gaps' found fewer and fewer caverns of intellectual darkness in which to live."[15]

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[13] The term 'God-particle' is derived from Leon Lederman's book: *The God Particle: If the Universe Is the Answer, What Is the Question?* New York: Delta Press, 1993.

[14] "Anything but the God Particle," London: *The Guardian*, 29 May 2009.

[15] Mills, *Atheist Universe*, 86.

This genre of crusading or proselytizing atheist is somewhat of an interesting breed in the history of philosophy. The history of philosophy has known two types of atheists exemplified in two thinkers: Friedrich Nietzsche and Richard Rorty. Nietzsche was a Prussian philosopher raised in a strict Christian (Protestant) household: most of his immediate male family members were Protestant ministers. He lived a strict religious life, but found when he reached maturity that religion could not offer the answers he hoped to receive. Nietzsche's problem with religion was not on the level of truth or justification, but rather on the existential and moral level: he deemed religion (especially Christianity) to be ugly, weak and decadent. He yearned for a strong, beautiful and life-affirming existence. As a consequence, he had to deny religion and set out unto the unknown critiquing all traditional and stable accounts of truth, morality and social organization. The death of (his) God was a horrible experience to Nietzsche. Richard Rorty is an American philosopher propagating pragmatism and liberal irony. He holds to a form of 'cheerful nihilism' or the simple acceptance of the non-existence of God. The vacuum that filled Nietzsche with horror is simply accepted by Rorty as a matter of fact. Some authors have pointed out that Rorty's easy-going acceptance of nihilism and the worthlessness of being can be a dangerous venture.[16] The new proselytizer atheist seems to have certain characteristics of both Nietzsche and Rorty: they claim to simply accept nihilism and the non-existence of God, but still feel a certain amount of passion to free themselves and others from religious prejudice.[17] They venture upon a crusade to persuade others to forsake their religious beliefs and become pious atheists.[18] On the other side, we find a number of religious advocates who explicitly set out to bring the atheist back into the flock by any means possible. It seems that both sides are digging deep into the trenches and refuse to budge therefore blocking any and all communication. I think that this stalemate is due to certain drawbacks of the 'God of the gaps' concept. In what follows I will attempt to shows its shortcomings and offer a new perspective on religion that can work in order to re-open the lines of communication.

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[16] See, for instance, K. Carr, *The Banalization of Nihilism: Twentieth Century Responses to Meaninglessness*, New York: University of New York Press, 1992.

[17] Ian Markham draws a distinction between 'fundamental' (Dawkins et al.) and 'real' atheism (Nietzsche). He continues to argue that Nietzsche's atheism is the only real atheism because it affirmed the horrifying consequences of atheism such as the downfall of epistemology, morality and social order. This recourse is often made by contemporary defenders of theism: they claim that most areas of human interaction, most importantly morality, will fall to shreds if theism is rejected. Ian Markham, *Against Atheism: Why Dawkins, Hitchens and Harris Are Fundamentally Wrong*, Oxford: Wiley-Blackwell, 2010. The atheists try to show that morality does, in no way, depend on religion and that often the more religious nations have the highest crime rates. See: D. Cupitt, *After God: The Future of Religion*, London: Phoenix, 1997, 101-106; D. Brink, "The Autonomy of Ethics," in *The Cambridge Companion to Atheism*, M. Martin, ed., Cambridge: Cambridge University Press, 2007, 149-166; Dawkins, *The God Delusion*, 241-259; Mills, *Atheist Universe*, 47-53; Stenger, *The God Hypothesis*, 193-215; Dennett, *Breaking the Spell*, 278-308.

3. The Limits of the God of the Gaps

There seems to be an innate tendency of human reason to be ill-satisfied with that which is unexplained. The history of philosophy speaks of philosophers stating that it was wonder at the strange and unfamiliar world that enflamed their philosophical pathos. Socrates, in Plato's dialogue *Apology*, recounts the tale of his election by the oracle of Delphi as the wisest of all the Greeks. His wisdom consisted of the self-acknowledgment of his own ignorance and the drive to attain sure and stable knowledge. Kant, in his *Critique of Practical Reason*, claimed that he was filled with awe and amazement by the starry skies above him and the moral law within him. This amazement moved him to his own critical philosophical process in order to make sense of metaphysics and morality. In a way, the avowal to some form of 'God of the gaps' is an ersatz solution to be rid of wonder and amazement.

According to Dawkins, both science and religion are moved by ignorance, but in different ways. Science is driven by ignorance as it tries to overcome it by filling the gaps with determinate knowledge through scientific research and experiment. Religion, so claims Dawkins, rejoices at ignorance and thrives through it. There is an innate tendency of religion to manifest and preserve ignorance as religion thrives on gaps in scientific and rational investigation. In this perspective, the logic of religion is defeatist and lazy.[19] Dawkins raises an important point about some forms of being religious such as creationism and intelligent design theory. These forms of religion actually thrive on the gaps in science and claim that God must be postulated to fill these gaps. However, scientific gaps are progressively filled and there is no reason to assume that there are scientific questions that are fundamentally unsolvable.[20] In this way, creationism and intelligent design theorists feel the chilling gaze of scientific progress in the back of their necks and are forced to be progressively retreating. While I do not doubt that a lot of creationists and defenders of intelligent design are honest believers, they unavoidably turn God into an ersatz solution to real knowledge.

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[18] Attesting to this fact in a dreary fashion is the so-called Converts' Corner on Richard Dawkins' webpage. On this page, people who have converted to atheism can share their tale with the world. Remarkably, however, the majority of people who respond to the page are those who more or less have been atheists their whole life or those who only moderately believed in religion and who have let go of their residual faith as they read Dawkins' work. It seems that the pious and fundamentalist believers are not convinced by Dawkins' rhetoric.

[19] Dawkins, *The God Delusion*, 151 ff.

The 'God of the gaps' turns God into a negativity: the holes that science has not filled (yet) are the refuge of God. Whenever this outcome is presented to a religious believer, he would find this hard to accept. Still, when questioned about the legitimacy of their religious beliefs and the existence of God, the religious man is often moved to point towards areas of knowledge that are not entirely clear yet. Still, how would this affect God-talk? The 'God of the gaps' holds an ambivalent relationship to science. They often defend the veracity of religious revelation but in a similar manner accept the obvious veracity of science as it is pragmatically able to explain and manipulate different aspects of nature. In this way, the progressive nature of scientific process pushes back the veracity of revelation. No learned man these days would ever defend that congenital diseases are punishments by God even though the Bible may say so. The truthfulness of Scripture is downplayed through scientific progress while still attempting to hold on to the ultimate truthfulness of religious texts. This relationship is, to say the least, problematic. One cannot behold the obvious truthfulness of science and scientific progress and still hold on to the absolute truthfulness of religious revelation.

Fundamentalists on both sides attempt to use science as a means to corroborate their claims and I find myself opposing both views as they share a similar prejudice, namely the 'God of the gaps.' Proselytizer atheists use science and its progressive nature to make plausible the non-existence of God or at least the falseness of religious convictions.[21] Creationists and defenders of intelligent design claim that the gaps of science are to be filled by the postulation of God: only through the postulation of a supernatural being could we make sense of creation, the intricate complexity of the human being and morality. As these areas of knowledge are progressively filled, the creationist is pushed back and forced to mitigate his point of view. This leaves religion, to say the least, in a poor state. The 'God of the gaps' thinks on God in negativity: an ersatz solution to difficult problems. I wonder if this is really the spawning ground of religious belief and whether science and religion really need to exist in an antagonistic relationship. I will attempt to introduce a different way to look upon religion in the next section.

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[20] In Stephen Hawking's latest addition to this debate, *The Grand Design*, he claims that while science can never really conclusively prove that God does not exist, it does make the existence of God unnecessary. This is somewhat problematic with regard to other issues raised in this book. Hawking adheres to m-theory which claims that there are, in grand total, 11 dimensions. As our knowledge of some issues in these dimensions increases, our other knowledge becomes more uncertain. For instance, the more we fix a particle's spatiality, the more uncertain its velocity becomes. Hawking argues that these uncertainties in no way invite speculation about God. See S. Hawking, and L. Mlodinow, *The Grand Design*, New York: Bantam Books, 2010.

4. The Positivity of Religion

In part, I would agree with Dawkins that religion is propelled by some form of ignorance, but this ignorance is not to be understood in a purely privative sense. One could speak of a basic perplexity that exceeds any determinate urge to overcome it: a fundamental astonishment that fuels religious passion.[22]

Religious passion and philosophical/scientific activity seem, at first glance, to be on opposite sides. A closer inspection however reveals an intricate and mutual relationship and inter-dependence. Religious passion prefigures any determinate attempt to make sense of the world; in fact, it is the driving force of our philosophical being. In primordial religious passion, the world is filled with value and man is open to this valuing outside of his own process of estimation and measuring. When the former Pope, his Holiness John Paul II, was asked why God seemed to be hiding, he responded by saying that the question answers itself. Our human nature is to be universally probing; always searching for proof and univocal disclosure. Yet, we are only able to ask this question if we are open to some notion of divinity and absolute value: our thought is, in the terms of Thomas Aquinas, determined by being which is infused with divinity. Ever since Modernity, we have grown accustomed to think on being as determined through thought and not the other way around. Think for instance of Descartes' claim that my thinking affirms my own existence (*Cogito, ergo sum*). If God were not a mystery, there would be no need for us to look for Him.[23] While I do not share the same Christian religious zeal, there is something to be said about this religious passivity. Our search for truth is fuelled by primordial mystery: should our zeal be to conclusively overcome this mystery, our passion would lose all ground. Finding the 'ultimate answer to life, the universe and the everything'[24] would be detrimental to human ambition as it would extinguish our desire. We need a constant re-awaking and revitalization in order to be desiring and ambitious beings. This makes us to think on mystery in a positive rather than a privative sense.

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[21] The most nuanced account of this is given by Daniel Dennett. He claims that all scientific insights ultimately support atheism. While I do not disagree with his statement, I do disagree with his assumption that scientific truth is the only real truth. Daniel Dennett, "Atheism and Evolution," in *Cambridge Companion to Atheism*, Martin, ed., 135-148.

[22] A thinker with a very nuanced and interesting perspective on perplexity and religious being is William Desmond. He claims that perplexity invites us to accept the idiotic or pre-reflexive goodness of being and throws us beyond immanence in a truthful search for hyperbolic transcendence. His work on this notion is most noteworthy; in particular: William Desmond, *Perplexity and Ultimacy: Metaphysical Thoughts from the Middle*, New York: State University of New York Press, 1995.

This new view on mystery can foster thoughts on religion in a more positive sense than the filling of gaps left by science. Religion can be taken to be the inspiration for our progressive search for answers and our delight in attaining greater and higher self-mastery. In all fairness, I must admit that religion can serve the opposite goal (and it has, far too often, done this): it can work to cultivate ignorance and work as a force for moral evil. This however does not mean that religion itself as a project should be forsaken; it simply means that our existing religions should be subjected to some form of philosophical scrutiny in order for them to fulfil their proper goal. Though some so-called religious zealots have taken religion in a wrong direction, there is no need to scorn the religious pathos as a whole. Think, for instance, of the story by Fyodor Dostoevsky in *The Brothers Karamazow* of the Grand-inquisitor. Around the year 1500, Jesus returns to earth and is imprisoned and questioned by the Grand-inquisitor. During the whole chapter, Jesus does not speak a word. The Grand-inquisitor goes to argue that Jesus' appearance and teachings would be detrimental to the Church as it has worked tirelessly to undo Jesus' message of love and responsibility. The Church has served to chain people and has taken away their freedom, forcing them into obedience. Jesus' answer is paradigmatic for true religiosity: he "suddenly approached the old man in silence and softly kissed him on the forehead. That was His answer. The old man shuddered."[25] Jesus answers by showing his love and attempts to re-awaken the religious passion of the inquisitor beyond his own petty will to power. True religion does not make any claims; it simply awakens awe and vitalizes the soul with the necessary passion to go forth. A different illustration of the same subject is seen in a philosophical narrative written by William Desmond.[26] Four different people are given the chance to elaborate their own views on the Biblical story of the Prodigal Son. The first is K (referring to Kant) who scorns the father in the story because he lets his son go astray and follow his passions. Still, this venture was necessary to attain true freedom. The second is H (referring to Hegel) who claims to appreciate the father's original generous giving, yet the son needed to go out in the world alone to fully come to himself. The third is M (referring to Marx) who states that the son's rebellion against his father was necessary for him to self-manifest himself through working in order to attain money. The fourth is N (referring to Nietzsche) who claims that it was the passion to leave a traditional home and wonder the high seas in search for esthetical self-creation that moved the prodigal son to leave home. All four of these claim that it was necessary for the Prodigal Son to refuse his father in order to become a true self. The father answers: "I let them go. It was good."[27] He allows each of them their claims and does not want to tyrannize any of them. He does not regret his original generosity to his Prodigal Sons: "They are all good boys at heart, and boys will be boys." He does not care that his sons might forsake him, as long as "the sweet glory of life is blessed … and when they call, if they call, I will come."[28] The excessive generosity of God is not exhausted by sin or rejection. God is the Old Man that allows people to be and act as they wish even if they ultimately act clueless. God is the mystery that vitalizes all endeavours to be and would accept even the harshest rebellions. Even the most committed atheistic scientist has a religious zeal, namely truthfulness. In this way, being religious is a way to manifest and revere the mystery that moves us all to be whatever we desire to be. The mystery invites us to be silent on some things: to let go of our probing speech and accept something that infinitely transcends us. Mystery is etymologically related to the Greek *muein* which means to close one's eyes and mouth and keep the mystery.

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[23] John Paul II, *Crossing the Threshold of Hope*, A. Knopf, ed., New York: Arnaldo Mondadori, 1994, 37-41.

[24] This term stems from the best-seller science fiction novella by Douglas Adams, *The Hitchhiker's Guide to the Galaxy*, New York: Del Rey Publishing, 1995. In the novella, a group of people are looking for the ultimate answer to all of life's questions and, when the answered is revealed to be 'forty-two,' they set out to search for the question itself. The search for knowledge must continue otherwise human existence is miserable. *The Hitchhiker's Guide* itself, which is the focus point of the novella, is an encyclopaedia that attempts to centralize all knowledge. The adage of the book is 'Don't panic:' we should not fear the mystery as it fuels our drive for knowledge. Ironically, this adage is quite akin to the exhortation that John Paul II made when he became the vicar of Christ, namely 'Be not afraid.' John Paul II, *Crossing the Threshold of Hope*, 225-229.

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[25] Fyodor Dostoevsky, *The Brothers Karamazow*. Transl. Garnett, C. (New York: Signett Books, 2007), 299.

[26] William Desmond, "Dream Monologues of Autonomy," *Ethical Perspectives* 5 (1998), 305-321.

[27] Desmond, "Dream Monologues of Autonomy," 320.

There is a side to this issue that might not be enjoyed by positivistic proselytizers. We might be allowed to deny the original giving and move away from it in our own way, truthfulness would beckon us however to rejoice in the mystery of the gift. A certain religious truthfulness invites us to accept that we are not the originators of our own curiosity, that we are not the fuel that makes our fire burn. The fire burns within us; we are living in closeness with a mysterious sense of divinity within us. This divinity is not to be understood in any scriptural or overly anthropomorphic sense, but rather as an openness to the sacredness and the goodness of human endeavour and being. This is at the heart of Friedrich Nietzsche's rhetoric when the last pope speaks to Zarathustra: "Some God within you converted you to your godlessness"[29] or, in my paraphrase, "it is the God within you that rejects the God above you." The God Nietzsche denies is the God that is the work of men; the projection of human weakness and intolerance. Nietzsche advocates a sense of divinity which could be associated with the ever-enduring search for value and playful creation of beauty. It is the God within him that propels him to love life (*Amor Fati*) and beautify being (Will to Power). This invites us to acknowledge that there is a sense of truthfulness that exceeds empirical truth; a truth that is not bound by scientific rhetoric. This sense of truthfulness can work as a means to enable communication between religion and science.

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[28] Desmond, "Dream Monologues of Autonomy," 321.

[29] "*Irgend ein Gott in dir [dass] dich bekehrte zu deiner Gottlosigkeit.*" Frederick Nietzsche, *Sämtliche Werke. Kritische Sudienausgabe in 15 Bänden*, Herausgegeben von Giorgio Colli und Mazzino Montinari, Verlag Walter de Gruyter, Berlin, 1967-1977, Band 4, 325 (My translation).

5. Truth and Dialogue

Science and religion, properly understood, are quests for truth; yet, their respective truths reside on different levels. The conflation of these levels of truth leads to fundamentalism on both sides as we have seen with the notion of the 'God of the gaps'. In order for dialogue to commence, we need to discern between three levels of truth and confine religion and science to their proper level. Only then are we able to move towards a rational faith or faithful rationality.

I can discern three different levels of truth. The first and most basic level is empirical truth which is the sole domain of science. Religion has no business in making empirical statements. Religious stories should therefore never be read in any all-too-literal fashion: their truth lies beyond the empirical. The theories of creationism and intelligent design are therefore moving beyond their reach: one cannot make empirical claims from the viewpoint of religion. The second level of truth is moral truth where religion and science overlap. Science cannot make claims on 'ought' or 'unconditional value' which are very central concepts of morality. Religion however, as it is fundamentally open to value that transcends autonomous valuing, can make value judgments on certain things as exceeding empirical worth. Religion is assisted, on this level, by science as it can temper the unconditional call of some valuing by prudential and practical reasoning. Kant's moral philosophy was for instance not open to prudential reasoning as it focuses very strongly on unconditional value: we may, for instance, never, no matter the circumstances, lie. Empirical prudential reasoning might open us to accept some exceptions to sacred rules. The level of morality is a constant dialogue between unconditional values and prudential casuistry. The third level of truth is the transcendent level which is the sole area of religion. Transcendent truth ushers us to acknowledge a primal passivity preceding our own desires and ambitions.[30] It beckons us to be open to tradition, infinite love and the goodness of being prior to any attempt to value this from an immanent standpoint.[31] Science is filled with a spirit of instrumentalisation which cannot make sense of intrinsic value; religion opens us to accept inherent value through perplexity, beauty and sacrality. The truth of religion is to give meaning to personal experiences, communal life and any and all scientific ambition.

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[30] In this way, the area of inquiry into our religious being is reserved, for the most part, to philosophical inquiry. Theology, as the study and interpretation of sacred texts, can be helpful to refresh our openness towards religion; it should, however, refrain from making statements that transcend its scope. A popular new way to approach religion, often called 'light religion,' is professed by the theorists of the theological turn in phenomenology such as Jacques Derrida, Emmanuel Levinas, Jean-Luc Marion and John Caputo. Caputo defends a theology of the event. John Caputo, *The Weakness of Go*: *A Theology of the Event*, Indianapolis: Indiana University Press, 2006. He claims that our intimation with God can only come through a Logos of the Theos (Word of God): theology itself tries "to follow the track

If science and religion limit themselves to their proper areas, not making claims that exceed their potential, we can have a faithful science and a rational religion. A rational religion would be a religion that is cleansed from empirical claims: we abstain from making claims on the origination of the universe, the empirical veracity of miracles performed by Jesus and the reality of an afterlife whether Heaven or Hell (as well as other empirical claims that may originate from reading religious texts).[32] A faithful science would be a science that acknowledges that it is not the only human activity that is worthy to be affirmed; it is preceded by a

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of the name of God to stay on the trail it leaves behind as it makes its way through our lives." Only through confrontation with something 'eventful' can we come to be intimated with God and we should be "praying for the courage to welcome this event." While I admire his candour in perpetuating the mystery of religious being, I do feel conflicted about his insistence on a passive acceptance of divine events. I believe that we ourselves should set out to find God in the mystery of being and not merely confess our own fragility. In Caputo's view, we should "confess to the poverty of our philosophy" and welcome the theological event. I would claim that philosophical inquiry into the mystery of being can better lead to a more truthful and finessed understanding of religion beyond theology.

[31] Keith Ward has argued for a similar perspective on this, but I fear that he has a different outcome in mind. He claims that "the question of God is certainly a factual one, but certainly not a scientific one" as it can never be conclusively settled. We need to open ourselves to a truth beyond scientific truth which "atheists are missing … [they] need a widening of vision that will disclose the reality of God to them" (Keith Ward, *Why There Almost Certainly Is a God: Doubting Dawkins*, Oxford: Lion, 2008, 143). Ward seems to be too much taken in by his Christian faith in a personal all-powerful God and fails to perceive what transcendent truth really entails.

[32] In an attempt to further their polemic and spiteful attacks on religion, some atheists condemn rationalizations of religion. Dennett claims that any abstraction or rationalization of religion does not constitute a real religion anymore and real religion is to be scrutinized by science as a deceptive naturalistic process (Dennett, *Breaking the Spell*, 10-18). Stenger claims that "one can always abstract any concept so it is out of the realm of scientific investigation. But these gods would not be recognized by the typical believer" (Stenger, *The God Hypothesis*, 11). Their rhetoric is so obsessed with destroying religion that they fail to see that a rationalized version of religion can be very beneficial to man.

religious openness that determines its own practices. Should religion make any claims that trespass on the area of science, these should be rejected. Yet, if religion stays on its place proper as a source of inspiration, motivation and sacral service, it should be left to its own devices. On the level of morality, science and religion should remain in constant respectful dialogue. Religion should make science ever wary of the fact that not everything can be simply exchanged for something else; for example, some things have value exceeding their monetary value. Science however should remind religion that their uncompromising absolute claims might not be appropriate given a certain situation. This dialogue should be held with the utmost respect and sincerity in search for truth.

6. Conclusion

The adherence to some notion of a 'God of the gaps' inevitably puts religion in a poor position and can only lead to a negative notion of God and religious practices. I have tried to re-open the possibility for a more positive understanding of religion that transcends the fundamentalism on both sides. We have started to think of religion as a passion for the mystery of being which should be affirmed in truthful honesty. Science and religion both have their role to play in human life but should be kept in their proper place.

As God-talk was progressively being silenced and a 'philosophy of God' seemed to belong to the dim and distant past, philosophers have grown hesitant to speak on God and religion. The theological turn in phenomenology with protagonists such as Jacques Derrida and Jean-luc Marion has given the first stimulus towards a renewed, finessed argument on the divine. The more general debates, however, still focus on God in a negative sense, aptly named the 'God of the gaps'. At times, it seems even to be inappropriate to mention God in educated, much like Nietzsche's madman experienced when professing his message. William Desmond phrases this intuition very aptly as follows: "I remember a time when to mention God or religion in the company of advanced intellectuals was like mentioning sex in a prudish Victorian drawing room. An icy silence would descend, and the silence communicated more than the argument possibly could: we do not now talk of these things"[33] I think we are on a threshold here: either we re-open ourselves to a positive sense of mystery and offer religion its proper place or we recede further and further into shallowness. Personally, I am more inclined to be profound and not shallow.

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[33] William Desmond, *Is There a Sabbath for Thought?* New York: Fordham, 2005, xi.

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Reflection

COMPLEMENTARY NATURE OF SCIENCE AND RELIGION

Filipe Neri Ferrao◆

1. Introduction

As the local archbishop, I have been given the task of delivering the inaugural Address at this august gathering of people of science and of religion, who have converged to debate on a topic of never–diminishing relevance: Catholicism in the World of Science.[1]

I suppose the task given to me also includes the duty – which I would like to perform with the greatest of pleasure – of welcoming you all to this conference in the name of the church in this Archdiocese, which rejoices on the occasion of the fourth century of this great institution of human and priestly formation known today as the patriarchal Seminary which is the oldest existing institution of its kind in the whole Asian continent. Countless indeed are the priests and layman who have left the portals of this house and spread throughout Goa, India and the world at large, bearing the light of knowledge and of the catholic faith, of science and of religion.

◆**Dr. Filipe Neri Ferrao**, the Archbishop of Goa and Daman, inaugurated the International Conference on Science and Religion organized to commemorate the 400th anniversary of the founding of the Rachol Seminary which was established by the King of Portugal San Sebastiao in 1610. This article is the inaugural address delivered by Ferrao on 17th December 2010.

[1] Archbishop Filipe Neri Ferrao inaugurated the *Sangam* International conference on 'Science and Religion' held in connection with the 4th Centenary celebration of the establishment of the Rachol Patriarchal Seminary in 1610. The young and dynamic Portuguese king Don Sebastiao was instrumental in constructing the huge edifice within four years time and became a centre of learning where even Swami Vivekananda came and stayed for a few days in order to learn about Christianity. It was also a centre for science since the missionaries from Europe landed here with their scientific gadgets like telescope on their way to China to spread Christianity through the instrumentality of science which was indeed a successful method. Archbishop Felipe in his inaugural lecture presents the complementary nature of science and religion and refers summarily on to the various interactive dynamics between religion and science that played historically and makes the clarion call for closer ties between them so that the environmental and other problems infesting humanity today could be resolved and sustainable progress can be enhanced.

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And today, it is precisely science and religion that bring us together, as we celebrate four hundred years of this institution's fruitful contribution to our state, to our country and to the world. This quadric-centennial Seminary has always been a temple of learning and a lighthouse of Faith. Its existence through the last four hundred years has been a great saga of academic as well as spiritual endeavour. Therefore, it is but fitting that we should celebrate this centenary with an event like this wherein people of science and of religion come together to uncover important questions which are of common concern and which are vital to the larger human community which they both serve.

As Rachol Seminary crosses this significant milestone let me congratulate all those who are presently part of it: the Rector, the staff, the seminarians and the non-teaching staff. I would like to express my sincere appreciation for all that you signify to the church in this archdiocese. I would also like to convey my heartfelt gratitude to all those who have actively collaborated with our seminary to organize this international conference on 'Catholicism' in the world of science; chiefly the Pontifical Council for Culture, the Division of Humanities of St. John's University, New York, and the Indian Institute of Science and Religion, Pune. I also welcome and thank all the resource persons for their presence and valuable contribution towards the success of this venture. I appreciate the enthusiastic presence of all the delegates and I hope that the presentations and deliberations of this conference will enrich one and all, so that we can arrive at a deeper understanding of our faith in the context of today's world of science.

You have chosen a very engaging theme four your Conference. Allow me to present a few reflections on it. I shall divide my presentation into three parts. In the first part I shall deal with the relationship of science and Christianity in general. Next, I shall elaborate on Science and Catholic Faith and finally I shall indicate how an attitude of radical openness can define the future direction of the dialogue between Science and Catholicism.

2. Science and Christianity

The church has always shown great interest in science and has, in fact, been irretrievably connected with development. In fact, many noted scientists, like Alfred North Whitehead and Paul Davis, hold that science as a gift of Christianity to the world. This claim is no exaggeration, although we must not forget the contribution of Hinduism, Islam and other great religions to the development of Science. Many of the founders of modern science were clerics, monks and deeply believing faithful. Neither Galileo nor Kepler, nor Newton was a sceptic or unbeliever. Many scientists, in fact, thought that they were trying to understand God through the understanding of creation. Celebrated scientists like Francis Collins and Allen Sandage, who were avowed atheists, acknowledged at the later state that it was Science that brought them to God. Thus we can trace within Christianity a vibrant dialogue, with science, ranging from the acceptance of science as an enlightened teacher and partner to an established rival and enemy.

2.1. Duhem-Jaki Thesis

Catholic Scholars like Pierre Duhem and Stanley Jaki have argued for the Christian roots of modern science. Their view sees a direct link between Christian metaphysics and the emergence of science and this is hailed as the Duhem-Jaki thesis. This is echoed in the sociological investigations of Robert K. Merton, who opines that ethics was responsible for the rise of science. Much in the same way, the German sociologist Max Weber tied the rise the capitalism to Calvinist ethics. But the Duhem-Jaki thesis rejects these standard views about the origin of science, by pointing out that ethical conditions are only extrinsic cause for the emergence of science. Such condition existed in three great ancient cultures, namely China, India and Egypt and yet modern science did not develop in these cultures. It developed in the West, instead. Duhem and Jaki conclude that Christianity – the western model of Christianity – led to the birth of science. This view states that it is our faith that seeds to the growth of science, which has today become a massive fruit bearing tree.

2.2. The Draper-White Thesis

Although there seems to be a consensus about the Christian origin of modern science, most people believe that, as science grew, it became a rebellious child and spawned conflicts within the Christian society. This conflict theory has been christened as the Draper-White thesis and views the relationship between Science and Christianity as hostile.

This conflict thesis was quite popular during the late 19th and early 20th centuries and can be traced in our days to the work of Richard Dawkins, who regards religion as the root of all evil. With the passing of time, however, the Draper-White thesis was shown to be unfounded, and its acceptance among scholars has declined, thanks to the developments in science and it was finally rejected in the 1970s. As a result, in contemporary circles, most scholars consider the conflict theory as inaccurate and even obsolete.

In our country there is no place for any war between science and religion. The famous Indian scientists of the yesteryears as well as of the present have found no contradiction between one's specialization in science and one's religious beliefs. What, however, plagues Indian science and one's religious beliefs seems to be a cosmic metaphysics which is part of the very ethos of our country. I refer to the fact that our mainstream society considers the external world as illusory. This is perhaps the reason why we have not been world leaders in scientific innovation, despite the astounding development of science in our country.

2.3. The Two Books Thesis

Although the conflict thesis has lost most of its adherents, the two books thesis has gained momentum among several scholars. It revives the famous Faraday's Rubicon, which states: "when we open our laboratory we have to close our oratory." This view is based on the two books model which was proposed by Francis Bacon, who thought that God has given us two Books: the Books of Scripture, and the Book of nature. The priests read the book of spiritual, the word of God, and the scientists read the Book of natural, the work of God. Karl Barth and many theologians opt for this model, claiming that the only way to ensure harmony between Science and Christianity is to keep them separate in water-tight compartments.

2.4. The S-R-D Thesis

Twentieth century Physics, with the development of special and general theories of Relativity, Quantum Theory, Chaos and Complexity, etc., has brought about a certain humbling of Science, making Science open to religion. Luckily, there were parallel developments within Christianity that led to openness religion to Science. The atmosphere of openness catalyzed by the Second Vatican Council, the reopening of the Galileo case, Pope John Paul II's Letter to the Scientists, etc. have led to the transformation of the reception of Christianity in the scientific circles and vice versa.

As a result of this, the Science and Religion Dialogue become acceptable to historians of science. Religious organization and clerics figured prominently in the origin and growth of science, although it became progressively secular with the professionalization of the scientific enterprise. Buoyed by these developments, the Science–Religion Dialogue – which is greeted as the S-R-D thesis in our country – has grown exponentially, across the globe.

3. Science and Catholicism

The new amity between Science and Religion opened many vistas which illumined the dynamic history of Catholic Faith in dialogue with the World of Science. The Institutional Church has cultivated and fostered science, particularly in its infancy. Members of many religious orders took active part in the development and promotion of science. It may be noted that in the middle ages, the monasteries in various parts of Europe became the custodians of scientific heritage, including Greek science. The works of Robert Grosseteste, Bishop Lincoln and Roger Bacon, a Franciscan who taught optics and experimented science at Paris and Oxford, have been well recognized by scholars. Moreover, Copernicus, a Cathedral Canon, Gregor Mendel, a Catholic Augustinian Monk, Geroge Lemaitre, a catholic priest of the of the Brussels-Mechlen Archdiocese from Belgium and the devout French layman, Louis Pasteur, have made remarkable contributions to science and have become beacons of inspiration to generations of future Catholic scientists. Johann Christian Poggendorf lists 1847 scientists in his *Dictionnaire des Sciences Exactes* from antiquity to 1863. Of these, 10% are priests and religious.

The Jesuit Order has been always thought of as a scientific order in the Church and has made great contributions to the growth and spread of science across the globe. Christopher Clavius was the mathematician behind the Gregorian Calendar reform and was instrumental in propagating mathematics and physics through the schools the Jesuits established in Europe and developed the culture of science. The historian of science, George Sarton, observed that one cannot think of mathematics in the 16th and the 17th centuries without the presence of a Jesuit. The Jesuits brought, in many ways, western science and technology into our country. They brought in the telescope to Goa from Rome and from Goa to China as an instrument of evangelization. Similarly brought the printing press into Goa and perfected our cartography and accurately measured the latitudes and longitudes of our land mass. This very building housed one of the printing presses brought by them, the third printing press in the whole of Asia, to be precise. Many Jesuit scientists came to Goa and, from here, went over to China, Japan and other countries in the East. The school culture and the development of a science enriched curriculum initiated by the Jesuits were taken up by other religious congregations belonging to the Catholic Church and vigorously propagated all over Europe and to other countries and paved the way for the emergence of great scientists like Galileo, Descartes, Louis Pasteur, etc.

All these do not mean that the relationship between the world of science and the Church was always smooth. The trial and condemnation of Galileo and the militantly atheistic Darwinism had, for a long time, fuelled the hostility between Science and Catholicism. The clouds of suspicion that arose in the context of the Copernican Revolution have been shown to have arisen due to many other factors and even personal grudges. Hence, the reopening of the Galileo case by Pope John Paul II in our days became an important step towards the reconciliation of science and Christianity. The controversy triggered by the evolution debate emerging from Darwinism is also reaching a higher level of understanding. As a result, the theory of evolution is now seen as compatible with the Christian view of creation. Moreover, Darwinism has never been formally condemned by the Church. Pope Pius XII had already affirmed that there is no conflict between evolution and the doctrine of faith regarding the origin of humanity, provided the origin of the soul was accepted as a direct act of God. The *Humani Generis* regarded evolution as a serious hypothesis, worthy of investigation. More recently, Cardinal Gianfranco Ravasi, Head of the Pontifical Council for Culture, declared that evolution is compatible with the doctrine of creation.

As the clouds of suspicion are being blown away, we are able to appreciate the dynamic relation between the Church and the world of science. The foundation of the Papal Academy of Sciences and of the Papal Observatory, the teachings of Vatican II on Science and Technology, the Letter of Pope John Paul II to the scientists and the encyclical *Fides et Ratio* have all demonstrated the radical openness of the Church to the world of science.

4. Radical Openness in the Religion and Science Encounter

Science and Religion overlap in many ways and the separation principle seems to be far from helpful for a desirable dialogue that will evoke a sense of mutual involvement of the two. A dynamic interchange prompted by a basic radical openness can lead to broader areas of shared understanding and concern, without necessarily destroying the autonomy of science and religion. It is crucial that the conversation between these two powerful forces in our society, based on critical openness and interchange, should not only continue but also grow and deepen in quality and scope. Science and religion can establish a common interactive relationship, in which they retain their own integrity and yet are radically open to the discoveries and insights of the other. After all, they need each other to be what they must be, what they are called to be.

Pope John Paul II has succinctly presented the benefits of our engagement with science when he said: "theology ... must be in vital interchange today with science just as it always has been with philosophy and other forms of learning. Theology will have to call on the findings of science to one degree or another as it pursues its primary concern for the human person the reaches of freedom, the possibilities of Christian community, the nature of belief and the intelligibility of nature and history."[2] This clarion call for a radical openness between Theology and Science represents, indeed, a most relevant response of the Church to the signs of the times.

It is in this context that I hail this initiative of holding an International Conference on the theme, 'Catholicism in the World of Science'. I am certain that the enlightened inputs of the learned resource persons and the deliberations of our vibrant delegates and our beloved seminarians will enrich us all individually and the Church at large. The Church in Goa considers herself blessed to host this unique event in this Patriarchal Seminary of glorious tradition, and I wish all the success to everything that will take place during these four days.

This conference should become an important occasion for us to look back and to look ahead. Our reflection on the amazing successes of science can become for us a stimulus to come before our God in wonder and awe. The human spirit cannot be subdued, for human beings rise on the wings of faith and reason and raise the questions like "Why is there something rather than nothing?" or "How do the equations that accurately describe the cosmic phenomenon work?" bring back forcefully the divine horizons into our this-worldly life.

Science also amplifies our understanding of the entire creation. It brings into special focus the face of humanity. And human beings are in constant search for a more profound meaning of life. It is faith that complements and illumines the insights from science. That is why we need the dialogue to bring together the scientific perspectives and the domain of faith and morals. This dialogue has the power to help us proclaim our faith to our contemporaries, because it speaks to them in a language they understand, and therefore it has the power to bring about a re-evangelization of human culture. What I mean to say is that the world of science has become like a new *Areopagaus*, wherein we can evangelize our culture, while remaining in an active dialogue with science. This active dialogue can help permeate the world of science with the values of the Gospel, leading to the transformation of humanity. The often elitist, atheistic and capitalist driven science and technology can become more humane through such an encounter with faith and this encounter can alternately provide a conscience to the world of science.

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[2] Pope John Paul II, *Message to Rev. George V. Coyne, S.J, Director of the Vatican Observatory*, June, 1, 1988.

The Pastoral Constitution on the Church in the Modern World, *Gaudium et Spes*, given to us by the Vatican Council II, exhorts all Christians to "blend modern science and its theories with Christian morality and doctrine. Thus their religious practice and morality can keep pace with their scientific knowledge and with an ever advancing technology." In recent times, the Church has been in the forefront in these reflections on morality. Encyclicals like *Humane Vitae* of Paul VI, *Veritatis Spendor* and *Evangelium Vitae* of John Paul II, as well as Instructions like *Donum Vitae* and *Dignitatis Personae*, given by the Congregation of the Doctrine of Faith, have made the Church a lighthouse that guides the path of humankind.

The role of the Church is irreplaceable in the institutionalization of love that seeks the integral good of the human person drawing us to an active dialogical engagement with the world of science. In our country, this engagement becomes simultaneously an inter-religious dialogue. Science, being the common heritage of humanity, becomes non-threatening table of fellowship and offers new opportunities for evangelization. Hence, the public square, the university and the market arena have become new pulpits for evangelization. This dialogue with science, with its inter-religious rippling effect, will indeed help us to diffuse the Kingdom of God among our countrymen.

To the Church in Goa this conference is an invitation to appreciate the power of dialogue with science. We hope it will generate and catalyze a new spirit of evangelization that will face up to the pastoral challenges posed by the developments in science. This conference is indeed a gift of God that will enable us, in a way, to bring the world of science at the feet of the Lord of Science. That is why I see this conference as a kairological event, a kind of a new Pentecost for all of us. May this great Jubilee of our seminary be a springtime that will infuse new life into its entire programme of formation, ensuring that we have ever more effective and mature pastors and evangelizers in tomorrow's world of science. I pray for all of you, dear participants in this Conference. You have everything to gain from this great event. I pray that your continued engagement with science, enlightened by your faith, may lead you to be true modern evangelizers of our culture. The human community which you serve has a right to demand this from you.

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BOOK REVIEWS

Coelho, Ivo, ed., ***Violence and Its Victims: A Challenge to Philosophizing in the Indian Context***, Bangalore: Asian Trading Corporation, 2010, pages vi + 380, ISBN: 8170865808.

Violence, a phenomenon that probably co-existed with humanity, continues to haunt us even to this day with menacing vigour and vitality. There is significant difference in the intentions, forms, and structures of the violence that happens in the day-to-day world than the violence of the primitive era. That is, a paradigm shift has already taken place in the very structure and practice of violence. As we look at violence from a philosophical point of view, we would be prompted to hold that while the ancient human race used violence for their existence, the modern human race uses violence both for existence and essence.

The attempt made by the Association of Christian Philosophers of India (ACPI) to initiate a discussion on violence from a philosophical point of view in its thirty-fourth annual meeting is praise worthy. The papers that had been presented and discussed in the general annual meeting of the ACPI on the issue of violence is made available in a book format under the title *Violence and Its Victims: A Challenge to Philosophizing in the Indian context.*

The book contains three sections. The first section, titled “Philosophical Reflections,” treats violence from a general philosophical point of view. The seven papers in this section help us see violence from different philosophical positions. This section begins with a discussion on “human being as violent” by initiating a discussion on the difference between animal violence and human violence. Here, the discussion centres around the ontological aspect of human being having its roots in pride and greed which can be substituted with Marcelian concepts of ‘being’ and ‘having’, and is ‘subjective’ in nature in terms of Heidegger and sees ‘the other as a threat’ in Sartre. This section discusses the issue of violence and human rights along with an ethical response to violence. The author reminds us that violence is not merely physical but also structural and, therefore, there is no neutrality. Hence, he concludes that a violent response to violence cannot be ruled out right away as unethical. But the discussion on human rights and violence puts us in a dilemma, as violence leads to violation of human rights. Then, the question emerges as to whether the human rights and violence can be universalized? If so how?

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This set of questions can be solved if another set of questions are answered; that is, what can be considered as the basis both for human rights and violence? Where do human rights come from? Who has the legitimate authority to enforce them? Though these questions may be powerfully answered through 'reason', according to the postmodernists, it is a poor basis for human rights, as reason is often, if not always, biased in favour of the powerful.

The second section of this book, under the title "Religion and Violence," consists of five papers, which analyse violence in Hinduism, Christianity, Islam, Buddhism, and Jainism, the major religions present in India. The common thing that can be traced in these religions is the concept of 'nonviolence' (*ahimsa*), which captures everyone's attention in the religious teaching of these religions. But it is also interesting to note that in spite of the presence of rich religious legacy, concepts like '*jihad*', '*dharmayudha*', 'crusades', etc., which these religions hold on as belonging to the core of their religious identity or principles, justify violence in some way. This confuses us between what could be considered as violence and nonviolence in religious circles. The Hindu religious texts like *Ramayana*, *Mahabharata*, and to some extend *Laws of Manu*, though considered to be very sacred, do promote violence not only physically but also verbally. It is interesting to note that although the core teaching of *Mahabharata* is "*ahimsa paramo dharma*" (nonviolence is the highest good), the sacred text narrates a series of violent events and characters. While the *Mahabharata* justifies violence as an 'ethico-spiritual war', the other sacred text *Ramayana* justifies violence as 'eco-spiritual war'. *The Laws of Manu* and, to an extent the *Upanishads* and the *Bhagavadgita*, treat violence completely in another format which is against human dignity manifested in the form of the caste system.

This section continues with a discussion on violence in Islam, a religion standing for peace. But as we glance through the section we see that the early Islam answered violence with violence and termed it as self-defence. Islam considers '*jihad*' as an inner struggle in one move towards God, but in later stages this inner struggle became an armed defence. In the Gospels, we see Jesus Christ, whom the Christianity considers as the saviour of the world, is committed to nonviolence; he preached universal love and asked his followers to follow suit. Christ in the Gospels is picturized as a personification of nonviolence. The church, in the course of time, however, became an oppressor with the advent of political power. The last paper in this section presents Buddhist and Jain responses to violence. Buddhism considers violence as intentional destruction of human life and Jainism takes an uncompromising stand towards violence. Both Buddhism and Jainism encourage disarmament, social and economic justice along with human rights and call for protection of the environment.

The third section of this book, consisting of five papers, examines different social aspects of violence. The first entry in this section, "Violence against Women in India," takes into account the domestic as well as public sphere where various kinds of violence endured by women in India and calls for a change in the attitude of the people. As we all are created in the image and likeness of God, we should utilize our ability to recognize the dignity of all human beings, which calls for respecting both the sexes equally and seeing God in the other. The second aspect which this section discusses is the violence against Tribals as structural violence because they are deprived of their land, language, and their history. They suffer all kinds of mismanagement from the authorities which erode their identity and development. This is the same case with Dalits. They are also deprived of their socio-economico-politico status. This is all because of the caste system which still prevails in Indian mindset and socio-cultural structures. This section concludes with the analysis of violence in media. Media has a definite role in inflicting violence in the minds of the people because of its wrong intentions and motives. Though this influence is indirect, it remains a serious concern, as it is said, "pen is mightier than sword." The media can function both ways: positively, it can uplift the society from violence and, negatively, it could infuse violence in the people of the society.

The extensive coverage on the issues pertaining to violence in Indian society that this volume offers definitely deserves our admiration. However, a question remains: How can we give an understanding of violence which could be universally applied? As violence does not carry the same connotations everywhere, it would remain a difficult task. However, it is not impossible as the process of globalization which is happening in this world certainly will help us to give violence a universally acceptable meaning and mechanisms to effectively curb its menacing penetration in the inner recesses of social existence.

Lonesh Mathew

Mathew Vekathanam, ***Revelation-Reason-Faith: Perspectives in Fundamental Theology***, Bangalore: Asian Trading Corporation, 2009, pages 303, ISBN: 8170865107.

Rationality of man is the characteristic that differentiates him from every other being. All his searches too have the rational thrust. The theological deliberations down the centuries too had the rational drive to substantiate the viewpoints from different contexts and ambience. In this context, the book, *Revelation-Reason-Faith: Perspectives in Fundamental Theology*, by Mathew Vekathanam becomes relevant as he brilliantly elucidates the notion of revelation and faith in the backdrop of reason.

The author leaves no stone unturned to articulate the scriptural, traditional, and contemporary faces of fundamental theology in a coherent manner. In the very introduction, the author clarifies the term 'fundamental theology' in contrast to the negative connotations of 'fundamentalism' and 'fundamentalist approach' that are mistakenly associated with this notion.

The initial chapters deal with the foundation of theology and the sources of certitude. The scriptural pursuit of the notion of revelation is explored quite scholarly in the second and the third chapters of the book by dealing with the New Testament as well as Old Testament approaches in a detailed manner. The following chapters are the logical and sequential enunciation of the beautiful and enriching milestones of the journey that the fundamental theology passed through the centuries. The book is a guide to all those who want to tread the arena of fundamental theology with proper understanding of revelation, reason, and faith, the trilogy of this creditable work.

Though it carries the peculiarities of a textbook, it is indeed an intellectual fiesta to the readers of all walks of life who are interested in being enlightened on the foundational presuppositions of Christian Theology. The author deals with the Church documents, both modern and ancient, as the firm background of theological reflections on Christian Revelation. After a presentation on the gradual development of fundamental theology, the author deals with revelation and miracle in the concluding chapter. The most important and the most central miracle is the self-disclosure and self-giving of God to human beings in the incarnation and resurrection of Jesus Christ.

While congratulating the author for this scholarly, coherent, and concise presentation of Revelation, Reason, and Faith, I recommend this work as a source of deeper illuminations in the intellectual exploration for many who want to capture the profound realms of these realities.

Gregory Kondakasseril

Ashok K. Gangadean, ***Meditations of Global First Philosophy: Quest for the Missing Grammar of Logos***, Albany, NY: State University of New York Press, 2008, pages: xx + 308, ISBN: 978-0-7914-7605-5.

Ashok K. Gangadean considers that there must be fundamentally something original in the first philosophy. In various cultures and religions, we see the divergent and pluralistic stories. But these stories have basically complementary characteristics and a deeper meaning in the primordial logos. It can be seen also in the religious, philosophical, or scientific worldview. What is being first is not named, but it permeates everything in the universe. It is self-existing and independent immediate and preserves self-unity in an ever changing differential flow of time. It cannot be 'finitized' by our egocentric reason. It is articulated '*Aum*' in Hinduism, as 'non-dual absolute' in 'Advaita', and '*Sunnya*', the ultimate emptiness, in Buddhism. It is also named Yahweh, Christ, Allah, or Truth and Beauty, but no name can exhaust it. Any attempt to limit it by our egocentric mind would suffer in Buddhist insight and is *māya*, according to Sankara. Awakened souls persue it as relational unity in multiplicity and polarity. Hebrew worldview affirms the oneness of the logos. In Chinese, exploration of the reality as Tao is the primordial presence of the nameless prior to unity and plurality. In early Greek thought, Socrates, Plato, and Aristotle focused on articulating the ultimate unifying power that binds together, that organises the vast plurality of things into organizing the field of life. Parmenides meditated deeply on the ultimate reality and saw that this reality must be absolute, eternal, and unchanging. On the other hand, Heraclitus used the same rational thought to penetrate deeply into the ultimate reality, into the unifying condition, and he found only constant change, perpetual becoming, radical flux, with nothing ever remaining the same, but only the flow and radical becoming. Such is the contradictions and paradox in the employment of reason.

In philosophy, there is a quest for the primary laws of thought persisted through the diverse traditions of the world. We express inconceivable or unthinkable thought in the language and grammar. It is one thing to converse and communicate with people who habituate and share the same worldview and to communicate with the other. On the processes of communication and interaction between the other, our thought and language undergo a sea of transformation. The author gives the example of the interactions of Christian religion with diverse cultures and its changes from its Judaic roots. In the same way, the early Buddhism and Zionist all underwent tremendous change thorough the complex living in the Diaspora.

This is true to the pluralistic cultures down the centuries. The heart of the natural change and cultural evolution is the same logos. Gangadean considers his own effort as the quest for the first philosophy and an intense forceful desire to unify the ever changing universal cosmologies, theology, philosophy, and other narrations. It is the cosmic story of logos that plays at the heart of evolutionary process of cultures, languages, and religions. However, the split and dualism between nature and culture, between natural history and human history, between matter and spirit, have been so deep that accounts of evolution of this polarized realm often appear to have nothing in common.

Materialistic account of the evolution of external nature appears to have no common ground with spiritual accounts of the origin and evolution of human conscious and its cultural developments. The author places the biblical narration of creation and Darwin's evolutionary theory and modern Big Bang theory side by side, and claims that the universe is a spontaneous event of eruption, appearing to be diverse in narration.

Gangadean feels that the any attempt to unify the divergent stories must be based on the story of logos having a global vision in mind. We must not use the highly developed human technical mind to understand the emergence of the story of logos. For this the human conscious reason, discourse, and knowledge are needed so as to advance to the deeper cosmic events of the logos itself. In this evolved human consciousness, the dream of logos unfolds and it is the basis for the global ethics. It is a spiritually awakened and deeply transformed experience. Jesus' love command, Buddha's compassion, Taoist and Confucian mandate of heaven and moral principles are the examples of this global play of logos. The primal reality is so deep and profound, it has no name but it is the basis of all names and forms. No religion or culture can ignore, but in an awakened conscious this unity is more glaringly clear. As human beings are dialogical beings, they cannot live in isolation. Any ego-centric independent self-existing human being is simply unacceptable, according to the author.

The author learns this unity in interreligious dialogue and infarctions, and it has been captured with its variety and dynamism in this commendable work. This book is a guide towards discovering the unity in the plurality and multiplicity which is the basis of all unity, harmony, and ethical living.

Maxim D'Souza

Michael Naickanparampil, ***The Gospel of Mark: Themes Explored,*** Bangalore: Asian Trading Corporation, 2009, pages xvi + 259, ISBN: 8170865115.

The Gospel of Mark: Themes Explored, a book by Michael Naickanparampil, very scientifically deals with various themes in the Gospel of Mark such as Markan Christology, the significance of the person of John the Baptist in the beginning of Jesus' ministry, role of the disciples, the implications of the Kingdom of God, and the hostility and the passion that Jesus faced in Jerusalem.

Section I deals with the style of Mark in his writings. Mark is aware of the significance of the traditions of his time, and he is guided by specific theological motives and doctrinal interests. In Section II, John the Baptist is presented as the forerunner of Jesus in suffering and death. The sequence of the first Elijah and, then, the Son of Man is also mentioned as climaxing in similar suffering as the destiny of both.

Section III elaborately deals with the Markan Christology. Mark presents the Gospel as a document of faith and Jesus as the hero of the story. Jesus instructs his disciples, after each Christological revelation, of the mystery of his passion in the central section of the Gospel. In the next chapter, the Kingdom of God that Jesus proclaimed is presented as a gift, unconditional and unmerited, but at the same time as a challenging gift that calls for appropriate response of conversion.

The author presents discipleship as essentially Christocentric in nature, as it is a commitment to Jesus to follow him closely. The Gospel of Mark speaks of the purpose of discipleship as found in the person of Jesus himself. The purpose of discipleship is to be with Him and to continue his mission, thus, the focal point of the Gospel of Mark almost defining discipleship in Christological terms.

The book is unique in its style in conveying the message very creatively and with precision. One can also notice the rich and scientific content of the notes given at the end of each chapter, which would guide serious readers to have access to more related literature and research. Some of the teachings of Jesus are drawn out for deeper and thorough analysis, which has been carried out by paying attention to the original context and the contemporary application. The passion narrative is very elaborately dealt with, making it easily accessible for a good reading and comparison with similar passages in other Gospels.

The person of Jesus in the Gospel of Mark is presented as a mysterious figure. The Messiahship of Jesus expresses itself in and through the words and deeds especially in the authoritative teaching and in his acts of power. In a thoroughly scholarly way, the author compares and contrasts various passages from the Synoptic Gospels and helps the reader to get an in-depth understanding of the theme of the identity of Jesus. In his attempt to convince the reader about the real identity of Jesus, along with various references to other passages from the scripture, Naickanparampil unfolds it by way of a creative exploration and definite definition. The destiny of Jesus in the form of someone who came to suffer, die, and rise and to give his life as a ransom for many is beautifully brought out in the final chapter of the book. It elaborates Jesus as a man for all, especially for the gentiles; in fact, it is presented as the climactic point of the confession of the centurion at the foot of the Cross in answer to the question 'Who is this…?'

Undoubtedly, this book is an outstanding contribution to theological studies in general and Christological studies in particular. It will be an asset to have this book in the library and every reader will find great riches spread out through its pages. Indeed, the author is an expert in interpreting the specific thrust of the Gospel of Mark and what he communicates in and through the person and mission of Jesus. As it is found to be a resource book in area of scriptural studies, I recommend this book to everyone interested in understanding Jesus through the gospels and to all those who teach and study gospels for better comparative study and reflections.

Sisily Cherian

Christoph Stückelberger and Reinhold Bernhardt, eds., *Calvin Global: How Faith Influences Sciences* (Globethics.net Series 2), Geneva: Globeethics.net, 2009, pages: 257, ISBN: 978-2-940428-05-2.

Calvin Global: How Faith Influences Sciences is a collection of fourteen articles, including the introduction, which presents the faith, ethics, and the present day influence of the life and thinking of protestant reformer John Calvin (1509-1524), published in connection with his 500th death anniversary, and edited by Christoph Stückelberger and Reinhold Bernhardt. The first part of the book deals with the theoretical aspects of Calvin's faith and ethical views while the second part concentrates on the his present day influence in different parts of the world.

The first article by Ekkehard W. Stegemann considers Calvin as a genuine biblical exegete while the second article by Reinhold Bernhardt critically examines his theory of predestination from the background of his biblical scholarship. The author of the article realistically examines the theory and concludes that Calvin's acclaimed theory of the glory of God is a danger as it is correlated with the nothingness of human beings under the theory of predestination. Another notable presentation in the book is the article by Christoph Stückelberger, dealing with Calvin's theory of ethics which significantly influenced the development of modern capitalism. The article highlights Calvin's understanding of work ethics, desire for the common good, justice to the poor, prevention of corruption, etc., as the notable aspects of his ethics. The article dealing with Calvin's view on women's role in the church by Irena Backus also deserves mention. The article clearly presents the negative view of Calvin towards women and her role in the public. To a certain extent, the facts presented by the author remind us of the century-long gender bias that the intellectual world altogether promoted without guilt. The remaining articles of the book deal with the relevance of Calvin today, especially in the western world and in the Asian continent.

As the second book in the Globethics.net Series, the present publication deserves appreciation. The work is a useful collection of articles for the researchers in the areas of ethics and the development of protestant theology and its influence in the modern world. One drawback of the book is that most of the articles are loosely written without much serious references and the book does not present a bibliography of the writings of Calvin. As a centenary publication such references could have served the book as a serious reference work for researchers.

Abraham Joseph Vadakkemuriyil

Mathew, Joseph. *In Search of the Divine: New Essays in Philosophical Theology*, Kottayam: Vidyabhavan Publications, 2010, Pages: xvii + 262, ISBN: 81-89458-18-3.

In Search of the Divine: New Essays in Philosophical Theology is a collection of resourceful essays on God-talk. These essays exhibit the elegance, professional experience, and scholarly competence of the author, Joseph Mathew, in the field of philosophical theology. The book has nine chapters and an appendix (a phenomenological presentation of religious experience by Rudolf Otto, as its presented in his book, *The Idea of the Holy*), apart from a foreword by Jan Van der Veken, who has initiated the God-talk in a right mode.

The first chapter deals with hermeneutical [Religious] phenomenology that focuses on religious experience as neutral and universal in contrast to the classical [Religious] phenomenology that isolates religious experience into particular religious experiences alone. The classical phenomenology tended to be more idealistic. The author brings out the notions of 'limiting questions' (i.e., no answer can satisfy the question and any explanation would be defeating the purpose of the question as it would be one of limiting situation) and 'why' questions (i.e., the limiting question is qualified to expresses ultimate wonder). Both these questions would take us into the realm of *re-assurance* in the face of metaphysical shock or experience of contingency, anxiety, and chaos, and of *basic trust* in contrast to arbitrary desire for good and ordinary trust (i.e., one that is based on evidence of assurance).

The second chapter deals with the theme 'the absence of the Divine'. According to the early Heideggerian perspective, the traditional metaphysics is an onto-theology that gave importance to God that excluded 'Being'. In this attempt, he proposes either non-theism or a-theism. According to the author, Heidegger's project of grounding *Dasein* on itself, and the attempt to define it in terms of temporality was a failure as temporality is finite. *Dasein* is ultimately grounded on nothing outside of it. There is no relationship of 'thrown' with the 'thrower'. Heidegger makes a radical dualism of philosophy and theology by proposing the absence of God-talk in philosophy. The 'why?' question of philosophy is already answered in theology; hence, there is no possibility for a philosophical theology or onto-theology. The author contends that there needs a ground for even to talk about metaphysical questions, particularly that of *Dasein*; this ground is facilitated by the existential shock of *Dasein* who takes refuge (i.e., not an ethical or psychological refuge but an ontological one) in God.

In the third chapter, the author infers within the later Heideggerian notion the 'presence of God' in contrast to his 'absence of God' in the early thought. The author examines this position and proposes a future direction to the philosophical theology. Grounding of the being is a central project whether it is in traditional philosophy or in Heidegger. Being as ground of *Dasein* embedded in the temporality (i.e., authentic life of a *Dasein* consists in facing and accepting the contingency of existence and courageously living it) is a basic project of Heidegger. As stated earlier, there is no metaphysical grounding of the *Dasein*, other than nothing (lest it would degrade the being of *Dasein*). But this no-thing is the veil of Being. It reveals Being. The basic nature of Being is nothingness, coming from nowhere, gratuitous, givenness, incomparable, and transcendens. But it is 'more beingful' than anything else as a precondition for all beings as it is letting be, making things happen and it (nothing) participates in Being. While the early philosophy of Heidegger can be considered as a philosophy without God, the latter part can be considered as a 'theology without God'. In explaining Being, Heidegger runs his project parallel to the traditional Christian metaphysics and theology, as if he was 'sucking its blood to destroy it'. The author, by taking cue from Heideggerian scholars answers the accusations of Heidegger on the traditional Christian metaphysics. In his later philosophy, Heidegger has come to the identification of God and Being. Nevertheless, we are cautioned that they are not synonymous; Being is indifferent and alien, but God is personal and close. However, there can be a close parallelism when we consider God as supra-personal but works in the temporal rather than personal, substantial and beyond time.

The author initiates a platform for the possible God-talk, in the fourth chapter, with the help of Ian Ramsey. Though Ramsey belongs to logical tradition, he can be rightly accommodated to the empiricist tradition, especially to a phenomenology that gives importance to the meaning of religious experience and to adequate religious language for the expression of the same. The author, taking Ramsey's positions, explains the traditional proofs and attributes of God and the special characteristic of creation from nothing and so on (e.g., biblical disclosure of God as Rock, Fortress, Refuge, etc.) as part of cosmic disclosure. The cosmic disclosure is identical with the disclosure of 'I' as both depend on the empirically observable phenomena. The cosmic disclosure and the disclosure of 'I' have both objective affirmation as well as subjective experience.

In the fifth chapter, the author renders a reflection on the Divine with the help of Anselm representing the traditional philosophy and Hartshorne representing modern philosophy. Anselm has treated the existence of God in his second ontological argument as transcendental. Hartshorne has substantiated this argument with the help of contemporary logic, especially with that of Russell. The main argument goes in line with the argument of modality (i.e., contingent, necessary and impossible); transcendental modality is explained with tools of logical modality and ontological modality. The argument is that it is possible consistently to conceive of the idea of God such that none greater can be conceived, and the necessary existence is a predicate.

In the sixth chapter, the author brings about the proofs for the existence of God along the line of traditional Greek and Christian metaphysics. He affirms the role of God as the final cause (Aristotle), efficient and final cause (Aquinas), and first efficient cause (Newton). God as the creator and provider does not fit into the Aristotelian project; God as the ultimate end of everything does not fit into the metaphysics of Newton and God as just mechanistic mover does not fit into the metaphysics of Aquinas (he holds that an efficient cause has pre-knowledge and purpose). However, in the metaphysics of Aquinas, all these features are present: God as efficient cause, final cause and as the prime mover, creator and provider.

The nature and mode of existence of the Divine are brought out in the seventh chapter. How do we know that God exists? It is answered in the biblical term of 'love' by the author. The existence of God is conceived by different religions in their own way. All point out to an ultimate reality. The author gives various reasons for the different origination, conception, dogmas, and experiences in different religions. Just as different models can help us in understanding the ultimate reality, there are different religious models that help us to know who God is and what exactly the ultimate reality does in the domain of life. The model in Christianity is 'love' and this model is explained not only in terms of poetic and creative concepts but with rational and scientific flavour.

In the eighth chapter, 'Paradigm Shifts in Faiths in the Divine', the author explores the possibility of various religious views and the 'conversion' from one view to the other. Conversion is not a half-hearted shift of allegiance but involves the change of the whole paradigm, including beliefs, worldview, precepts, concepts, fundamental assumptions, and lifestyle (i.e., cumulative change due to the cumulative counterevidence of one's perspective and lifestyle). When such overpowering counterevidence occurs, there is no other course than to change. The author substantiates it by bringing out the paradigms in scientific world, especially that of Newton and Einstein and the reality of the shift of perspectives. The author contends that such a shift is possible and he gives a model of such from Christianity to any other religion or ideology or form of life.

Finally, the author brings out the logic of prayer-language. Prayer cannot be exempted from the ordinary language game. The logic of this game is non-linear; unpredictable, non-consistent but fills with insight, intuition, and leads to new experiences of the Divine. The linear logic of prayer goes on the rational and predictable terms; it does not go with the whole person or person's worldview or form of life. The beauty of the non-linear consists in unpredictability and surprises of Divine disclosure.

Though the author brings up various themes and angles, they all linearly ascend to the one theme, i.e., God-talk. He has taken into consideration most of the possible objections from different philosophical traditions, various worldviews, varieties of religious experiences and objective norms for the God-talk. These essays not only demand attention but also make a reader with minimum interest to continue reading till the end. The arguments are logical, precise, thought provoking, and appealing to both heart and mind. The language is rather simple considering the difficulty of the general scheme of philosophical language. The author has introduced many philosophical systems and philosophers of all time. He has synthesised and brought into forefront some of the hidden perspectives on God in these systems of philosophy and in the philosophies of various philosophers.

However, further clarification is needed in one area of the work. Though the author has brought out Newtonian theory of cosmology in order to fit into the metaphysical proofs for the Divine (chapter 6), he has not logically argued for the Newton's assumption that God created the world. Newton has explained all the movements in the world with a mechanistic view and as a Christian he presupposed God as the one who initiated the first motion. The presupposition has no logical support as in the case of Aristotle or Aquinas. On the whole, this part does not fit into the logically consistent and thematically coherent contents of the book, except that it is able to explain the mechanistic movement in the universe due to dialectical gravitational force of the things.

Nevertheless, the book stands out in the field of theosophy or philosophical theology. It can be considered as a compendium of the same. It is profitable for those engaged in the teaching profession, higher studies and those who conduct seminars, symposium, etc. The varieties of themes including spiritual theology would offer a new worldview, new insights into the role of logic and language, and a new interpretation of the religious experience in those who seriously study the book.

Vinoy Paykattu

Heidi Hadsell and Christoph Stuckelberger, eds., *Overcoming Fundamentalism: Ethical Responses from Five Continents*, Geneva: Globethics.net, 2009, pages 232, ISBN: 978-2-940428-01-4.

The book, *Overcoming Fundamentalism*, contains ten very relevant chapters that initiate us into discussion on issues that would keep us engaged the main focus on religious forms of fundamentalism It also analyses the political and economic fundamentalism from an ethical perspective. Looking at fundamentalism and ways to overcome it from an ethical perspective, as this book aims at, means to understand and evaluate the values behind fundamentalist and non-fundamentalist worldviews. This book has emerged out of an international conference on "Fundamentalism and Ethics," convened by the Globethics.net (a web based ethics content provider: www.globethics.net), in 2006, in Huissen, the Netherlands.

The first chapter, titled "Development and Fundamentalism," by Nigel Dower, a specialist on development ethics from Great Britain, mainly concentrates on North American Christian fundamentalism and Islamic fundamentalism. It also deals with the relationship between fundamentalism and development.

The second chapter, "Fundamentalism versus Liberalism: Towards a Hermeneutical Turn to Ethics," by Girma Mohammed from Ethiopia, looks at different Western and African perceptions of the relation between economic liberalism and fundamentalism. The demarcating borders between the two are sometimes completely opposite in Africa and in Europe. Liberal views in Africa can be seen as fundamentalist and vice versa. He looks at a hermeneutic of meanings and criticizes both liberalism and fundamentalism for their own preferred views on what is meaningful for life and society.

The title given to the third chapter is "Fundamentalism or Tolerance: What Is the Public Role of Religion in Modern Society." In this entry, Peter Pavlovic, from Belgium, makes a thorough study on the relationship between fundamentalism, tolerance, identity, and religion in Europe vis-à-vis the other parts of the world. Secularism has failed in Europe and does not convince people on other continents. Identity is strongly linked to religion and its communities. Hence, he argues that theocracy is not the solution to fundamentalism, but Europe needs to find a place for religion in public life as one of the conditions for a healthy society.

The fourth chapter, "Religious Fundamentalism and an Ethics of Recognition," by Joseph I. Fernando from Thailand, approaches the issues of fundamentalism from the experiences of Thailand. The author is of the opinion that many problems in the world are due to the rejection of the dignity and worth of the human person. He proposes an "ethics of recognition" in order to overcome religious fundamentalism. An ethics of recognition calls for the perception of other groups and their right to exist. An ethics of recognition is not necessarily an ethics of unanimity and consensus, but a healthy, humane, mature, acceptance of difference.

"Globalization and Religion from an Indonesian Perspective" is the fifth chapter contributed by Bernard Adeney-Risakotta from Indonesia. It evaluates several dominant narratives about globalization and religion from an Indonesian perspective. He treats globalization under four headings: (1) Globalization as a fundamentalist religion, (2) Globalization as a neo-colonial conspiracy, (3) Globalization as progress and development, and (4) Globalization as the capitalist world system. He concludes his argument saying that we are challenged to work together across religious, cultural, and national boundaries, to raise awareness, oppose false consciousness, combat unjust structures, care for the victims, and serve our neighbours.

The sixth chapter, "Democracy, Tolerance and Civil Society: Fundamentalism and Ethics in Indonesian Politics," by Nick T. Wiratmoko from Indonesia, shows the development and fragility of democracy in Indonesia. He analyzes Muslim fundamentalism in relation to *Pancasila*. The Indonesian concept of tolerance and respect, and the underlining the role of the civil society for the development of democracy in the country are also highlighted and acclaimed.

"The Economic Ethics of Christian and Islamic Fundamentalism," the seventh chapter, offered by Yahya Wijaya from Indonesia, looks at the economic interests and mechanisms of Christian Neo-Pentecostal and Islamic fundamentalist movements in Indonesia from the perspective of economic ethics. In this critical essay, he shows that both are led by foreign models. He calls for a contextual economic ethics with a Christian and Islamic underpinning.

Under the title, "Why Catholics Can't Vote Pro-Life?" Brett Salkeld from Canada looks at fundamentalism not only of the Catholic religious right in the USA, but also at leftwing positions in the same country. He proposes a theological answer from a holistic pro-life perspective in order to overcome fundamentalist one-sided answers.

"Tolerance, Democracy and Fundamentalism: Challenges in Time of Systemic Bifurcations," by Guillermo Hansen from Argentina, analyzes Catholic integrism as the dominant form of fundamentalism in Latin America. For him, fundamentalisms signal a refusal of modernity, democracy and secularity, which are seen as weapons of liberal foreign or western hegemony. Fundamentalisms are symptoms of the world system but not its cure because they are blind to the political dimension of love. He shows in detail the ethical foundation of tolerance as the basis for democracy and an answer to fundamentalism.

The final chapter is titled "Civil Alternative to Islamic Fundamentalism." In this entry, Muhammad Machasin, from Indonesia, in view of offering alternate solutions, disproves the theological arguments of fundamentalist Muslims. The author describes civil Islam as an alternative to Islamic fundamentalism. Civil Islam, according to him, is a way of practising Islam within a pluralistic society in a polite manner.

The entire collection in this commendable book is an eye-opener for those fanatic fundamentalists as well as those who want to understand this menacing problem across the globe. It has got a lot of things to offer in this era of globalization by way of containing fundamentalism by addressing the root causes. It is commendable that the organizers of the conference and the editors of this volume have taken extra care to make sure that there is a representation from different corners of the world that are key to understand the dynamics of the problem of fundamentalism. Indeed, a better existential grasp of the problem enables them to come up with pertinent recommendations to respond to the same. Since the authors are experts pooled from different countries and different denominations, a reader can better understand their feelings and thrusts. This collection, as its content is now availed to the erudite public in the form of an edited volume, will help us understand and respond to the other in a better way.

Roy Vettikuzhiyil

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